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ABSTRACT

The introduction to this UNISIST seminar report discusses problems in training present and potential users of scientific and technical information and emphasizes the importance of better recognition and formulation of information needs in order to effectively assess and use available libraries, information systems, and services. Papers presented at the seminar addressed the following topics: (1) Measurement of User Needs and Information Use; (2) User Education in Academic Institutions; (3) User Training in Technical Information Use; (4) User Education in National Documentation Centers; (5) Sensitization of Managers, Planners and Policy Makers; (6) User Training as a Component of National Information Policy; and (7) Means and Methods of Training Users. The recommendations of the seminar stressed the need for Asian members of Unesco, through their national focal points, to establish user education and training programs and recommended evaluation of users, training techniques, and availability of information and facilities; dissemination of the Unesco guide "Education and Training of Users of Scientific and Technical Information--UNISIST Guide for Teachers"; promotion of user education and training within the UNISIST program for assistance to member states; and the education and sensitization of administrators, planners, and policy makers. (RAA)

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UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

FINAL REPORT

of

UNISIST Seminar on the Education and Training of Users of Scientific and Technological Information

18-21 October 1976
Rome, Italy

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I. BACKGROUND

The problems of training present and potential users of scientific and technological information in the better utilization of information services offered to them is attracting increased international attention.

The seminar, held in Rome, was of an international character; all geographical regions being represented. The objective was to provide an international exchange of experience on the problem faced in planning and implementing training and education programmes for users of scientific and technological information, to obtain a broad overview of the issue, to catalyze international co-operation, and to advise Unesco on a long-term programme for user training.

The seminar was organized by Unesco in the framework of its UNISIST programme, in collaboration with the Consiglio Nazionale delle Ricerche, Laboratorio di Studi sulla Ricerca e sulla Documentazione and the Istituto Italo-Latino Americano (IILA). The participants chosen on the basis of their professional experience were invited in their personal capacity. There were 30 participants from fifteen countries and a number of organizations, such as ESRIN, FAO, IAEA, IILA and UNEP.

Following the presentation of papers, an extensive and rich discussion produced a set of ideas which are structured in the present report.

The recommendations which were adopted by the seminar show the range of preoccupations and programme activities that may constitute the basis of future developments.

II. INTRODUCTION

a) Opening of the Seminar

Prof. F. Ondarza Linares welcomed the participants to the Seminar on behalf of the Istituto Italo-Latino Americano (IILA) and Ing. A. Petrucci on behalf of the Consiglio Nazionale delle Ricerche (CNR).

In his opening remarks, Mr. J. Tocatlian, Unesco Division of Scientific and Technological Information and Documentation, greeted the participants on behalf of the Director-General of Unesco, and thanked IILA and CNR for hosting the seminar. He extended a special welcome to the representatives of UN agencies, such as FAO, UNEP, IAEA, and conveyed the gratitude of Unesco to the various Member States and organizations which had sent delegates to the meeting. A list of the participants is given in Appendix I.

Speaking about the scope and objectives of the seminar, Mr. Tocatlian pointed out that the ultimate goal of all information systems was to serve users; that scientific and technological information is needed by diverse groups of people for diverse purposes -- e.g. managers, planners, and policy makers in making decisions, research workers in minimizing the chances of duplication of effort and in identifying new lines of work, and engineers and technologists in finding solutions to problems arising from the production of goods and services. In fact, information is needed in most human activities, and the most sophisticated information system is of little value if it cannot meet the information needs of the clientele. Inefficiency and under-utilization of an information system may arise from faults in the design of the system itself, or from inadequate motivation and ability of the user to effectively use the system. The seminar would mainly discuss the latter question. Quoting from recent studies in the USA, Mr. Tocatlian pointed out that an appreciable amount of investment goes into the communication of information and also into the search and utilization of information; in the USA it is about 40 per cent for the latter activities. Therefore, if user education can help to economize on this, it would be worthwhile.

Referring to the agenda items, Mr. Tocatlian suggested that it would be helpful if discussions were focused on the following aspects: user needs and their assessment; levels of user education; means and methods of user education; and national policy on user education. He also suggested that "user education" be defined, for the purpose of the seminar, in a generic sense to cover any effort or programme for providing guidance and instruction to users, individually or collectively, enabling them to identify specifically their respective information needs, expressing those needs clearly, and facilitating the use and evaluation of information sources, services and systems to meet these needs. There is considerable interest in most parts of the world, he pointed out, in user education, as was evidenced during the recent Unesco meeting in Bangkok, and the proposed meetings of EUSIDIC and WFEO, on this subject. Unesco's contribution would be to create a forum such as the present meeting to discuss the issues and exchange information and experience thereof, to assist Member States to develop national policy on user education and to develop the necessary tools and guidelines. Mr. J. Tocatlian remarked that the wide range of participant profiles representing national focal points, national documentation centres, academic institutions, and individual experts involved in user education in developing countries in particular, and the variety of experts from developed and developing countries should provide adequate scope to study the problems from different angles.

b) Election of Officers

The following officers were elected unanimously:

Mr. Peter Lázár (Hungary), Chairman
Mr. A. Neelameghan (India), Rapporteur.

Expressing gratitude for the confidence placed by the participants in the elected officers, the chairman said that the issues for discussion were difficult but important. He added that Mrs Zahawi of IDCAS, who had earlier been proposed as chairman of the seminar would not be able to attend because of an accident and requested the meeting to authorize the Unesco Secretariat to send her a message of sympathy. This was agreed upon.

After some discussion, a revised order of the agenda items (see Appendix II) was accepted.

III. SEMINAR

a) Measurement of user needs and information use

Presenting his paper, Mr. T.D. Wilson pointed out that the key issue was investigation, not necessarily measurement, of user needs with a view to designing appropriate user education programmes. The categorization of users suggested by Havelock (section 2 of the paper) was considered to be applicable in most environments. The links and pattern of interaction of planners, policy makers, etc., in government with basic research systems, applied R and D systems, practice systems, and consumer systems was illustrated. Taking agricultural extension work as an example, the link role of extension officers between university research and farmers was pointed out and the need for education of these officers in information use was emphasized.

Studies of information needs and information seeking behaviour were differentiated. The user education programme should help to improve the information seeking behaviour of users, especially those involved in applied research and practice in science-technology areas. The need for identifying the complexity of factors and their impact on user needs and behaviour as outlined in Section 4 of the paper was emphasized.

As to the methods of investigating information needs and user behaviour (Section 5 of the paper attached), the inadequacy of survey by questionnaire and statistical averages was highlighted and the need for qualitative studies illustrated with a case study.

The question as to whether the information system should be adapted to user requirements or whether the user should be made to adapt to the system - that is, in which of these areas investment should be made - was posed as an issue for discussion.

The discussion centred on two key issues: (1) adapting the information system to user requirements versus changing user behaviour to adapt it to the information system; and (2) education of end-users and education of intermediaries.

Regarding the first issue, the concensus was that

-considering the ultimate objective of information systems to be that of providing efficient information services to meet the information needs of users, and

-considering the objective of user education to be that of making the user better able to utilize the information system and the information obtained,

it is not, therefore, a question of investment in one or the other programme as they are mutually interacting elements, and improvement in one could bring about efficiency and effectiveness in the other. It is a dynamic situation because the composition of the information user group changes, information needs change even with one and the same user, information seeking behaviour changes with experience and interaction with information systems, and information systems and information handling methods change. This evolutionary situation demands more or less continuous adaptation and rapport between the two components in order to ensure productivity and effectiveness.

Regarding the second issue a suggestion was made that the seminar might consider the education of the end user only. However, the discussion pointed out several difficulties in imposing such a restriction. For example,

-theoretically, in a given context, it may be possible to identify the end user; but in a real-world situation the role of a user may change from that of an end user to that of an intermediary and vice-versa. The technical manager of a small firm, for instance, may seek and use information for his own work. He is then an end user. In a different situation, he may seek information, interpret and repackage it for use by the floor-level technician. In that case the technical manager has the role of an intermediary whereas the floor level technician would be the end user. This also applies to extension officers who may assume different roles in different contexts;

-even in a research environment, a senior research officer or head of a division may deploy his assistants to search and obtain the needed information for the research project in which the team may be involved. In this situation the senior officer has an end user role but his assistants may have dual roles as end users as well as intermediaries;

-when we move from considering a particular information system to improving the information handling capacity of the social system as a whole, the distinction between end users and intermediaries may be invidious.

User education should cover any person involved in one or more of the following activities: seeking, accessing, using, evaluating, interpreting, repackaging and transferring information either for himself or for others, excluding the librarian or information specialist who forms part of the information system.

In developing countries in particular, to confine the education programme to end users only would be unhelpful. The development of on-line machine-based information access systems also makes such a distinction among information users inadvisable.

Other issues discussed included the following:

-the early warning signals mentioned in Mr Wilson's paper are useful guidelines.

-the difference in the state of development of the information infrastructure and cultural characteristics among developing countries should be borne in mind when designing user education programmes.

-motivation of the user to seek and utilize information and identifying the gap between information needs and the sources and services available are important functions of user education.

-interactions with users in user education activities have educational value to information specialists themselves in evaluating the efficacy of the information systems and the education programmes.

-on-line information access systems introduce new elements and the whole approach to user education needs to be examined afresh, and not merely carry over the approach and methods used in training of users of conventional information systems.

-there is need for a built-in feedback mechanism in each user education programme, excepting the most simple ones, to facilitate its evaluation and adaptation.

-user education should take into account not only the content of information but also how the information is to be presented to different categories of users - researchers, managers, extension workers, school children, the layman, etc. A distinction should also be made between the user's need at a particular point in time for a particular purpose and his overall interests, and also between actual information need (for a particular purpose) and the potential or perceived information need.

-inadequacy of available resources in a particular country for instituting national user education programmes may be overcome through collaborative arrangements among different organizations in the country or region, and through international assistance.

-attracting senior research officers, professors, and managers for a user education programme is indeed difficult. But an appreciable part of such education takes place through the rendering of good information services, when the users realise the vast range of information resources available and the capabilities of the systems to provide access to these resources which might not have been possible if the searches were made by the user on his own. There is also the latent user education in that he learns as to which source to use, when and for what purpose.

-the question as to who is competent to determine the real information need of the user is not easy to answer. It depends partly on the type of user - researcher, manager, extension worker, etc. A researcher with a good subject background may be able to clearly realize his information

need. However, an information scientist knowledgeable about diverse information resources and having had interaction and experience with a wide range of users and inquiries, can help in specifying the user's needs through a systematic dialogue with the user. It would be ideal if a subject specialist with additional specialization in information science could be deployed to help each user.

Mr Wilson summarised his response to some of the issues raised:

- the discussion had highlighted that the aim of user needs investigation should be understanding rather than simple description. Mere statistical counts of document use would not lead to such understanding. There were two principal obstacles to understanding:

1) the tendency to apply models derived from experimental scientific research to what is basically social investigation, and

2) investigator bias resulting from an orientation towards documentary information sources: a number of participants had pointed out that several categories of users or potential users use other sources of information and a variety of informal channels to transfer information.

- information use studies should help to disclose the types of services needed to meet user demands, the modes of utilization of information by different categories of users, and the most suitable channels of communication.

- how to carry out investigations to reveal the appropriate kinds of information relevant to training is an important question and there are some important points to be made: firstly, surveys are expensive to conduct thoroughly and for practical purposes, it may well be desirable to acquire some information from a small number of interviews which may then result in a clearer definition of the problem area and give guidance on how to proceed; and secondly, carrying out surveys is no alternative to thinking - doing desk research with relevant documents may be more fruitful.

- in studies of user needs, it is helpful to determine which group needs most help and take follow up action. This should prove more economical and effective rather than an undifferentiated general user education programme.

- study of user reactions to information service and user education programmes would help the information professional to determine more closely the information needs of users.

- better information use may lead to changes in organizational structure and facilitate information flow and the information system should be designed to take advantage of these changes.

- it is necessary to have a good knowledge of information products and tools needed in user training programmes - e.g. some users may more easily accept notes for guidance prepared by subject specialists or authorities in the field.

- user education should be considered as a component of the total programme for the development of an information system suitable for meeting the information needs of the clientele, taking into account the personal and environmental factors that influence the programme and the information system.

- user education programmes should be dynamic and flexible, with inbuilt feedback mechanisms to provide for its continuous evaluation and adaptation to changing needs and environments.

b) User Education in Academic Institutions

Introducing his paper "A Note on Some Aspects of the Education and Training of Users of Information in High Schools and Colleges", Mr. Neelameghan pointed out that the effectiveness of user education in a given context depended, in a large measure, on the perception of the role of the library and information system (LIS) in academic life by the faculty, the administration, the students, and the information personnel. This perception varies widely among and within these groups.

The premises on the basis of which user education programmes are developed in academic institutions may be summarized as follows:

-information use studies have pointed out many inadequacies of information systems and services. User education could improve the utilization of the less-than-perfect systems;
-User education could lead to better student performance;
-the dynamics of change in information systems necessitate continuous awareness of the new elements in the system on the part of users. User education can help;
-the search for information is costly, and training in information search may help to increase productivity of users and reduce the cost involved;
-faculty members unaware of their limited knowledge of information sources, etc., in their areas of specialization could be exposed to the additional resources and services through user education;
-efficiency in the use of information can be more conveniently achieved through user education in the school and college environment rather than when the user has entered a working or professional career;

The need for academic policies and library and information policies to facilitate the consistent development and effective operation of user education programmes was emphasized. Some of the elements in such policies would include (section 3 of the paper attached):

-proficiency in information use as an educational objective and training for it as part of the educational programme;

-designing the curriculum and adoption of teaching methods that would necessarily involve student and faculty use of LIS;

-organizational and administrative arrangements to ensure information staff involvement in key faculty committees, adequate support for user education programmes, and academic status for the library and library professionals;

-ensuring the educational role of the library and cooperative programmes with the faculty in user education;

-developing flexible and adaptive user education programmes reflecting the changing concept of the library and information systems. These should be course oriented, demonstrated and gradated.

Mr. Neelameghan enumerated several causes for the resistance and apathy that may be encountered in implementing user education programmes (section 4 of the paper attached). The recommendations suggested in section 5 of the paper were then discussed.

There was a difference of opinion as to who should be teachers of information use: the subject specialist or the information specialist. It was pointed out that the subject specialist is likely to be more acceptable to his peers and more competent in the subject-field. The recent Unesco-CODATA course in data handling in Zagreb was cited as an example. The information specialist would be more helpful in guiding the teachers.

It was suggested that the recommended survey of user education programmes should also cover "how to involve faculty members in user education programmes".

The extension of user education programmes for specialists in universities as a continuing education programme for practitioners in the science, technology, engineering and health fields was recommended.

The recommendation to examine the Unesco user education Guide was questioned on the grounds that the Guide already covers college and university teachers and researchers.

The experience of INFOTEC, Mexico, in involving its specialist staff in information use education programmes in universities and technical institutes was briefly recounted.

The integration of information user education into the curriculum was seen to be difficult unless the library and library staff enjoy a status comparable to other departments and their staff.

The special handicaps of developing countries were pointed out: teaching may consist of the distribution of mimeographed lecture notes only and the whole objective of education may be to pass an examination and obtain a certificate. Library facilities are generally poor. Unless the attitude and educational methodology are changed through pressure of national and international bodies, user education

programmes, however well conceived, will not work. Even faculty members may resist the change, for the change may mean extra work, re-education, etc. Therefore, some simple user education programmes and materials are needed so as not to intimidate the faculty members, and at the same time the materials can be conveniently and easily used.

An example of interaction of university faculty and industry and the information transfer process was provided.

It was felt that the recommendations, with some modifications, as suggested during the discussion, could apply to environments beyond college and university. It was suggested that the data collected by the recommended survey of user education programmes could be discussed in a future seminar. The need for taking into account the difference in cultural, economic, and social conditions in different nations when making the survey and developing user education programmes on that basis was emphasized.

c) User Training in Technical Information Use

Presenting his paper "User Training in the Context of a Technical Information Service", Mr. Sweeney said that most user studies are confined to students and researchers in academic and research institutions and user education programmes are designed on that basis for the academic people. But increasingly now we have to consider several multi-discipline-oriented user categories such as industrial managers, businessmen, etc. involved in profit-making activities.

The objective of user education in this context would have to be linked to improving efficiency in work, innovation, and introducing new products and processes. The sources of information and channels and media of communication are different from those for the academic user groups; they are also wide ranging and trans-disciplinary in nature. Further, the economic unit we are considering here is organic, dynamic and frequently changing. It is a learning system adapting itself on the basis of the information available about its complex environment. Such a unit may be a firm, a farm, or a government department wherein knowledge or information is used in forecasting and decision-making on a limited time-scale before the knowledge is superseded. Another aspect is that the knowledge is converted into or used in the production of goods or services. Studies indicate that on an average over 50 per cent of the industrial workers' time is spent in communication - receiving information. It is also known that successful innovators have extensive communication and contacts within and outside the organization. These may be individuals or institutions. The range of the types of information relevant to an industrial problem is wide - scientific, technical, economic, financial, market, socio-political, etc.

The information has a high obsolescence rate. Each decision situation in a firm is unique and needs a different information package, and the internally generated information is as important as the information flowing in from the outside, depending on whether or not it is for long-range planning, strategic planning, or routine operational problems.

Among the channels of communication, person-to-person contacts - formal and informal - through visits to the firm or farm, meetings etc., are important; vendors, salesmen, suppliers, consultants and the like are also valuable sources of industrial information. Mass media, exhibitions, open house, get togethers, etc. offer opportunities to gather and exchange information.

Information needs also vary within a firm according to the functions and roles of persons - management, R and D, production, marketing, extension work, etc.

All these factors should be kept in mind in making a user needs survey in industries and designing user education programmes for industrial personnel. The content and conduct of the courses should be varied depending upon the user group - e.g. sensitization for managers, short workshops for R and D personnel, and so on.

d) User Education in National Documentation Centres

Introducing her paper "Training of the Users of National Information Centres - a case study", Mrs Burian said that in a developing country information services should be development-oriented as foreseen in the economic policy of the country. Research should be oriented towards increasing the production of goods and services and the export potential. The industrial sector employs people with managerial, marketing and innovative capabilities and these constitute an important user group of the national documentation centre. They are concerned with the choice of appropriate and relevant technology, assessment of technology, and development of indigenous technology.

The research and development group, concerned with minimizing duplication of research in the country and developing new ideas, seek information relevant for the purpose.

Another important user group is constituted by the planners and policy makers especially in government departments.

In Turkey, modern universities have adequate library and information facilities, but the old and conservative ones lack resources. Therefore clientele of the libraries of the latter type of university tend to use the national documentation centre facilities. But, often university research may not be oriented to applied research contributing to national economic development. Also, the educational system is not conducive to developing student capability to use information and information sources effectively. Although it is the function

of the university library to organize user orientation courses, not all do so. Under these circumstances the national documentation centre has taken the responsibility and steps to organize user education programmes.

It has not been easy to attract senior scientists, industrial managers, etc., to attend user education programmes. Secondary services, translation service, reprography service, and publication services have been used as bait to attract them to the centre, and unobstrusively put them through the user education programme.

Mrs. Burian made the following additional observations:

-The research sector is a good clientele of the national documentation centre because of the lack of local information facilities particularly in small enterprises. This is also true of the small research establishments;

-Industry uses information in producing goods and services. The industrial worker is generally able to specify his information needs. But their communication ability may be poor;

-The long-range objective should be to enable the small establishments also to develop a local information unit;

-The large scale industries, particularly the multnational corporations, get information from outside and from their parent company or collaborators;

-Information is now sought by local industry in an increasing measure to try and promote indigenous research and innovation;

-In attracting the industry client, it has been found helpful to talk of information as an aid to profit making, to minimize business risks, etc.;

-The training of extension officers in information use is important because they, in turn, train the people in industry. The extension officer must gain the confidence of the industry; be able to identify and analyze the problems of the firm and provide reliable advice and information of practical use. He should have ability to communicate and present the information in a manner easily grasped by the entrepreneur.

-In Turkey the extension service is the concern of industry and not of the national documentation centre.

-In attempts to create information consciousness among managers, extension workers, and industrial researchers, seminars, meetings and person-to-person contacts, are more helpful than printed material;

- Once information awareness is created and the value of information is generally realized, the user education programme would be decentralized - that is, centres other than the national documentation centre would take it up.

- International and regional meetings, seminars, etc. on user education should be oriented to and organized in developing areas.

The discussion of the presentations by Mr. Sweeney and Mrs. Burian ranged over several issues.

There was general agreement that user education should cover current awareness services as well as information relevant to a particular problem. Furthermore, the function of different services and which service is to be chosen for what purpose, should be explained.

The question was raised as to who is a user. Anyone who needs information irrespective of the purpose for which it is sought? It was pointed out that the credibility of information services also depends on the reliability of the information and of the source from which it is obtained.

It was suggested that information services should parallel educational development. User education at the primary school level would help to make a person into a better information user in his subsequent career.

Since few small enterprises have the resources to establish their own information facilities, they have to depend on national information services and user education programmes.

The need for correlation of user education policy and national information policy was reiterated. The suggestion was made that top management should be helped not by extension officers but by persons capable of information analysis and synthesis, relating it to the specific needs of the manager. The differentiation between user education programmes for managers, extension workers, and researchers was thought to be essential.

The importance of person-to-person contact in information exchange and dissemination, needs to be emphasized in user education for the industrial sector.

The training of librarians and information personnel in marketing information services and products was considered essential.

The problems arising from current awareness services in some developing countries appeared to be (i) non-availability (or only at some cost) of copies of the cited documents; (ii) restriction of the users awareness to the documents cited by the service; and (iii) a sort of complacency and consequent passiveness on the users' part. Creating awareness of the information sources, services and facilities within the country should be among the first steps in user education.

In relation to the question of applied research versus a basic research (Mrs Burian) : The reasons for scientists in developing countries going in for basic research were pointed out to be that applied research is relatively more costly, and basic research aides research manpower training. The lack of communication and information exchange facilities tend to produce a feeling of isolation among scientists in developing countries from other world centres of scientific activity.

It was pointed out that in-depth studies indicate further differentiation between information needs of small entrepreneurs, e.g. pre-investment needs and post-investment needs, and the sources of information. Current awareness services for small entrepreneurs should relate to items of practical value - e.g. on products, processes, relevant laws and regulations - and indication of the special characteristics of the product or process that make it more useful, or cheaper, or simpler to handle, etc. than those in current use. These factors need to be borne in mind when designing user education programmes for small entrepreneurs.

A categorization of users was suggested by Mr Wilson:

(1) the man in the street (requiring recipe knowledge;
(2) the well-informed citizen (requiring sufficient knowledge)to judge between expert opinions and
(3) the expert (requiring fundamental knowledge)

and an individual may fall into any one of these categories in different situations.

The question of confidentiality of industrial information was raised, but not discussed.

It was suggested that the seminar should recommend increased funding of Unesco's information activities so as to adequately cover the user education area.

Briefly responding to the discussion, Mr. Sweeney said that an overall conceptualization of the total system in industrial firms, government departments, farms, etc., was necessary in order to identify the information user categories, information needs, information flow channels, information sources, media, etc. The role of extension officers in identifying and defining problems, information requirements, information sources and evaluation of the relevancy and reliability of the information obtained was emphasized. Training on market information, statistical data etc., to those assisting managers was considered essential.

Mrs. Burian agreed that training of school children in the use of information was necessary in order to achieve long-range benefit; immediate needs and priorities should also be considered. It is not

difficult to identify local resources but mobilizing them for use is more difficult. The various steps taken in this regard by Türdok were outlined. The use of mass media, briefings, lectures, publication of popular articles, etc., to sensitize the authorities and the public to the value of information appears to have had some effect. She appealed for the assistance of international organizations in carrying out these activities. She added that university library schools are slow to change and face the challenges of developments in the information field.

Special emphasis was placed on harnessing the expertise and resources of professional organizations in user education programmes.

e) Sensitization of Managers, Planners, and Policy-Makers

Mr. Menou introduced the topic: sensitization of managers, planners, and policy-makers in government, industry and other organizations, with some general remarks on the reference framework which he felt should be considered when dealing with user training. He felt that the current terminology and thinking in information science, more or less limit the concept of 'information system' to what is in fact a subsystem of it, namely information (or materials) handling systems and techniques. It would be helpful, he suggested, to take into account the global information system, which is a component of society as a whole, when considering user education programmes. The question then would not be user education on information handling only, but the whole spectrum of information generation, diffusion, information systems and services, and information utilization and assimilation in society as a whole in order to produce new knowledge, solve problems, produce goods and services, make gainful decisions, etc. It would be more accurate, according to Mr. Menou, to speak of "non-specialist's training or preparation for information transfer and use" rather than of "users' training". This implies that users are considered as an integral component of the global information system, that all the activities by which they contribute to the process of information transfer and use (e.g. their own production, dissemination and evaluation of information) are dealt with and that the objectives are not only the acquisition of practical skills in order to perform them but also the acquisition of a value system and behavioural attitudes which facilitate the transfer and use of information.

It was also pointed out that due account should be taken of the overall manpower structure in the country concerned. Many developing countries lack graduates to fill professional positions and could not afford to specialize a significant number of them in information work. Therefore, the respective roles of non-specialists and of specialists in an adapted global information system and their respective training and preparation should be considered in an integrated way.

Returning to the question of sensitization of managers, policy-makers, and decision-makers, Mr. Menou pointed out that the activities implied here are performed by a variety of persons at different levels. If one accepts the idea that information transfer and use is more accurately defined by the type of action for which information is needed than by the broad socio-economic group to which the user belongs, then the targets for user training should be determined accordingly. There is, however, little doubt that in any given society it is possible to identify a group of persons exercising some sort of leadership and whose activities have a greater impact, directly or indirectly, on the allocation of resources.

Mr. Menou pointed out that there is another question: namely, whether we should consider the information needs and behaviour of the top people or their ability to create more favourable conditions for information transfer and use within their environment, including the setting up and/or support of formalized information handling sub-systems. Although the two aspects are clearly related, they should be distinguished in the elaboration of a user training programme, he added.

Two programmes were briefly described as examples of sensitization of managers. UNIDO has convened several regional seminars on industrial information. The participants are usually senior civil servants and managers in charge of industrial planning and development. The programme provided for the presentation of information needs and services for industry, site visits, etc., and reports on the status of industrial information in the countries represented and group discussions of current problems and possible solutions.

The German Foundation for International Development (DSE) is currently sponsoring seminars on the use of documentation and information for planning and decision making in the East African region. They are addressed to senior civil servants in a particular country and organized by a national body with technical and financial help of the Foundation. To date four seminars have been organized in Sudan, Uganda, Tanzania, and Kenya. Others are planned. The standard programme includes a presentation on information services, working groups to discuss problems and possible solutions in various areas of public administration, and site visits.

It is difficult to evaluate the impact of such seminars. Participants obviously get a deeper insight into the actual problems of information transfer and a better understanding of the potential contribution to their solution by information units. However, the improvement of information flow and the enhancement of the information infrastructure should be measured in order to correctly evaluate the long term impact of such seminars, and this is almost impracticable for the present, Mr. Menou said. He enumerated some of the factors which contribute to the success of such seminars:

-the homogeneity of the target group;
-an approach to the information problems from the point of view of the products, services or actions usually dealt with by the participants and not from the point of view of the information units;
-the availability of adequate information services and their involvement in the implementation of the seminar programme. Foreign specialists may have only a limited role as catalysts and resource persons.

Although it has a place in the training programme, the demonstration of and advocacy for the information handling units should not be overdone; other avenues should be sought for such promotional activities. On the other hand, non-formalized information transfer and the way in which properly packaged information could be directly incorporated into action should be stressed. Consider, for instance, a minister's cabinet. It might be looked upon as an information system assisting the minister in taking decisions. Who needs training here as an information user? The minister as well as his aides. But they need different kinds of training - the minister in specifying his requirements and how to use the information obtained in the given situation; his aides should be able to analyse the problems, identify and locate relevant information, evaluate the information and present it in an easily usable way.

This example leads, Mr. Menou pointed out, to a basic and difficult question: which methods are more appropriate to convince these top level persons of the need for training in information use? We do not know clearly the procedures and the rationale of decision making in their areas of responsibilities. We do not know either how to present the message we would like to convey. There is, however, some evidence that constant person-to-person contact is effective and that a practical demonstration of the usefulness of a good information transfer process, for instance when solving an actual problem, is more effective than a theoretical presentation. The credibility of the person who provides the message or information is also of paramount importance. It may be questioned whether information specialists can perform this function effectively. Perhaps, only a minister can convince another minister!

The discussion was largely focused on means and methods of sensitizing and convincing top authorities of the value of information and information systems.

In Hungary this has been partially achieved through a government decree which requires every director or manager of every economic unit to be responsible for developing systems for providing adequate information in support of the activities of their unit.

It was pointed out that the social decision-making process in different environments is not well understood, and that R and D managers have difficulty in using inter-disciplinary information and data. Good and effective information services that help in critical problem-solving and crucial decision-making may convince managers of the usefulness of information systems. But quantifications of its impact is still difficult.

Perhaps Unesco should be represented in national meetings of decision makers, planners, etc; that may have an impact and be informative to Unesco as well.

Case histories of how information helped to avoid duplication of efforts and conserve resources, solved problems, or triggered off new lines of work, and of disastrous consequences of not having relevant timely information, would be useful. Another approach is that where possible, managers may visit informations systems and learn of the services provided.

Information staff should have knowledge of marketing techniques to sell their systems and services, understand the visiting managers problem beforehand and prepare/ suggest an information product. Even in the first meeting some useful product should be provided. Awareness of the availability of other products and services can be created by providing a well-produced brochure. Efforts should be taken to create an internal environment in an organization conducive to innovations, which needs the use of information. Training of users has a special role in this respect.

The next step would be to help the organization in planning and setting up a local information unit.

Developing countries with poor infrastructure have greater difficulty and an uphill task of sensitizing managers, etc. The holding of management-sensitizing programmes sponsored by Unesco in such countries may have a favourable impact.

Arguments based on the economics of information service could help. In France, for example, 500 million francs are invested in information systems (excluding private industry). How is this public expenditure recovered? The information systems have a productive role in this respect.

In selling an information system it is necessary to determine the cost of establishing and operating the system itself in relation to what cost-benefits it may produce over a period of time.

People have to be motivated to use information. Situations which need information use have to occur or should be created.

Experience shows that:

- only a small percentage of managers accept the value of information;
- case studies are a useful but should not be over-done, and should be carefully selected so that if a demand for a service should arise or increase it should be possible to meet it;
- the U.S. government requirement from potential contractors to show evidence of their having thoroughly reviewed the relevant information on the subject has a favourable effect;

An important question for consideration is who should pay for the different user education programmes?

Identifying user information needs and training in how to handle information are important functions of user education. Information use affects behaviour: education does it for the man in the street; and for the specialists, specialized programmes are necessary. It is undesirable to impose blindly programmes used in developed countries on developing countries.

There is need to differentiate between selling an existing system and selling a new system.

In any case the requirement for the system to deliver products or services which match the user's needs in terms of scope, contents, lay out and language cannot be over-emphasized. Programmes for orientation of managers should not only consider the potential use of a given information handling system but also deal with all the environmental and organizational factors which directly affect the circulation and use of information. Mr. Menou concluded suggesting that managers' associations and management consultants may be used as intermediaries for the sensitization of this group of persons.

f) User Training as a component of National Information Policy

Mr. John Gray, presenting his paper on the subject, emphasized the possible first steps towards a national policy for user education and training and discussed the rationale for the steps suggested. He said that other papers presented at the seminar (cf. Neelameghan's) also mentioned policy objectives but in a restricted context, such as the academic environment, whereas his concern would be the whole user community and national policy objectives and practical steps in formulating them.

Talking briefly about the basis for each of the recommended steps, Mr. Gray said that:

- the differences as well as the common features among countries, irrespective of their stage of development, should be taken into account in policy formulation on user education;
- in most of the developing countries, resources are limited leading to poor information resources and service facilities, low utilization and the vicious circle of poor development capability;
- the recommendations of the recent Unesco meeting on user education in Bangkok are relevant here and should be borne in mind (see Appendix III). In fact, they cover more or less several of the points raised in the paper under consideration;
- in taking the first step, identification of the group or groups which are lagging behind with respect to information accessibility and utilization should be done through user studies, surveys, etc., so that the national resources allocated for user education can be spent in a productive way;

- consideration of the national economic and social structures and characteristics is also a prerequisite in determining priorities on the levels, types and techniques of user training;
- identify, assemble and mobilize the necessary reference materials, literature guides, etc. and the human, physical and financial resources for the organization and conduct of the user education programme;
- the preceding step would help to determine which institution(s) could handle the job conveniently and what external assistance might be needed.

Mr. Gray made the following suggestions for action:

- providing for feedback and evaluation of user education programmes;
- preparation of Unesco draft guidelines on user education;
- Unesco to carry out a survey of the existing user education programmes in different countries;
- amend the guidelines in the light of the findings of the survey;
- publish the survey report;
- discuss the survey and draft guidelines on user education in a future international seminar.

During the discussion, the following points emerged:

- it is necessary to state clearly the objectives of user education at different levels, e.g. improving information handling capability in general, and the effective use of literature for a specific purpose;
- where the information resources are weak, the first step should be to increase the information consciousness of people, so as to bring user pressure on institutions to build up source materials;
- in mobilizing and utilizing information materials for user education programmes, the question of language of communication may become a serious one in some countries;
- in addition to determining the extent of knowledge among users, their capability to identify their respective information needs should also be considered in the first step;
- availability of guides to local literature, and access to local literature, guidance kits, etc., should be given special attention in organizing user education;
- library schools and professional organizations could be tapped for teachers in user education programmes;
- UNISIST proposals on national science information policy objectives already contain useful statements in user education. Therefore the first step in the action programme for Unesco should be a survey of user education programmes which would also provide material for the elaboration of policy objectives on user education;

- it would be helpful to start user education at the school level which should also include the teaching of other skills such as reading and writing. This could form part of the general education programme;
- although there are perhaps no formal user education programmes in colleges and universities, informal teaching about literature search, identification of resources, preparation of bibliographies, use of non-line services, etc. becomes necessary in relation to class and project work. A survey of what is going on in this direction would be useful;
- in various other recent meetings, e.g. the Tunis meeting, the CASTARAB Conference, WFEO meetings, policy on STI has been discussed as part of the national policy on science, and user education in schools and institutions of higher education have been touched upon. There is a growing world-wide interest in the subject;
- in several developing countries efforts are being made to prepare inventories of available information resources; both documentary and human. Decisions regarding the institutions to be involved in the user education programme should be left to the local organizing group who may have better knowledge of the local resources and facilities available;
- the evaluation of the user education programme should be in the nature of a continuous monitoring effort and not a one-shot affair;
- in addition to surveys of user education programmes, some case studies/histories of how the programme came about should be collected;
- since there is now a general awareness of the need for user education, Unesco might take simultaneous action on drafting user education policy guidelines and also arrange for surveys of user education programmes. These are mutually enriching activities.

There was also some discussion on the definition/scope of user education. It was suggested that information user education should be considered as an integral part of the general education of the individual beginning from the early school stages. The objectives of user education, as it emerged from the discussion, may be summarized as follows:

a) General long-range objective.- Enhance people's awareness of the value and use of information as a resource and to build in them the attitude to seek information, as a means of coping with the day-to-day chores of life;

b) Specific objective.- Improve users' ability to:

- identify their specific information needs in relation to a specific situation encountered;
- precisely formulate the need;
- identify sources and obtain relevant information;
- evaluate the information obtained in relation to the problem on hand;
- productively use the information;
- produce new information and knowledge and perform better in the specific areas of their respective concern.

But, it was rightly pointed out that the Unesco Seminar had to confine itself, for the sake of convenience, to more specific user groups and define objectives of information use education programmes designed for them.

g) Means and Methods of Training Users

Presenting his paper on this subject, Mr. Evans briefly described the background leading to the preparation of the Unesco-UNISIST Guide for teachers, to be published in spring 1977. Unlike many other universities, the Loughborough University of Technology is closely associated with the industries in producing manpower for the different industries, in providing consultancy, and in student project work. The university library has a good clientele from industry and those who would ultimately be absorbed in the industrial houses. This situation brought in more than the ordinary pressure for instituting programmes for the education of users in identifying guides to technical information, human sources of information, etc. These experiences have been systematized in the Guide.

Mr. Evans outlined the preparation necessary in running a user education course, especially in a developing country, based on the workshops conducted in India and Korea to test the usefulness of the Guide. The factors to be considered include:

- "lobbying" to sell the idea of user education; determining the characteristics of the target group;
- institutional facilities, physical, information resources, human resources, available in determining course location;
- duration of the course;
- psychology of teaching, discussion, etc. to prevent participants getting frustrated;
- back up literature availability and access to literature;
- quality and qualifications of teachers;
- course structuring;
- identifying objectives of the course.

The content of the different sections of the Guide were briefly outlined, and the provision for and method of evaluating the course were stressed.

In the discussion that followed, the need and helpfulness of integrating user education programmes into the teaching programme in any subject was proposed.

It was thought that although the philosophy of user education may not materially differ, the approach, content, presentation etc., would differ according to whether or not the target group consisted mainly of college students, practitioners, or managers.

Some of the problems faced in having a clear idea of the characteristics of a target group in advance so as to prepare the programme suitably were described based on experience in other contexts, e.g. INIS training programmes.

Problems of language-barriers in communicating with the participants were highlighted.

It was pointed out that user education should start with students who will be the future practitioners. It was also suggested that such user education courses should be organized in close collaboration with national institutions, educational authorities, the ministry of education for instance, to derive maximal benefit and productivity.

With regard to a question on the future of the Guide, it was stated that:

- it would be published as a B category publication by Unesco in the spring of 1977;
- some copies would be distributed to national focal points, and other appropriate bodies particularly in developing countries, free of cost. Copies would also be sold;
- a modest budgetary provision is being made by Unesco to conduct workshops, seminars, etc., which is essentially a national responsibility, in order to obtain feedback and evaluation of the use of the Guide;
- modifications of the Guide, as may become necessary, in the future, might be made.

IV. RECOMMENDATIONS

A number of ideas and suggestions emerged from the papers presented and the discussion of them during the seminar. These relate to a wide range of topics in user education: surveys of user needs, national policy on user education, need for variations in user education programmes, methods and materials according to the category of the target group, the characteristics of a helpful user education programme, etc. Therefore, the recommendations enumerated in this section should be read along with the report and contributed papers for additional details and suggestions.

National Policy on User Education

1(a) Unesco, under its UNISIST programme, may commission a guideline document on national policy on user education. In formulating the guidelines, the policy elements enumerated in Neelameghan's paper may be taken into consideration.

(b) National policy on user education should be formulated as an integral part of the national information policy and in correlation with the national educational policy.

(c) The national policy on user education should preferably be formulated and implemented through the collaboration of the national focal point/the UNISIST national committee, the appropriate government departments and professional associations.

2. The following steps are recommended in formulating national policy on user education:

(i) Determine in broad terms the extent of knowledge and ability among users (research workers, practitioners, managers) to clearly identify their respective information needs, precisely state such needs, and indicate how to obtain and use information.

(ii) Determine in the light of (i) above, which levels, types and techniques of training should have priority, given limited resources; in particular, whether to concentrate on a "multiplier" approach, i.e. educating those who are in a good position to educate others.

(iii) At the same time ensure that:

(a) the leading guides to the literature, particularly the local literature, and guidance kits of proved value, can be made available for training purposes, with or without the related computer-based services;

(b) access is obtainable to the back-up literature from local or remote sources;

(c) potential teaching resources -- human and physical -- in the country and neighbouring countries are listed, evaluated and preferably mobilized.

(iv) In the light of (ii) and (iii) above:

(a) determine, with local cooperation, which institution(s) should be involved in the training programme, at least initially; and

(b) what form of technical assistance, if any, should be sought.

(v) Provide for evaluation of the initial activities and for modification and incorporation of the recommended steps in the long-term policy document.

Survey of User Education Programmes

3.(a) Unesco, under its UNISIST programme, should arrange, in collaboration with appropriate national, regional and international bodies, a survey of the user education programmes available and proposed in Member States. The survey should be designed keeping in view inter alia the following objectives:

- to identify problems and facilities available;
- to facilitate exchange of information on user education, nationally and internationally;
- to identify characteristics of successful user education programmes for different user categories at different levels;
- to incorporate elements of such successful programmes in future editions of the UNISIST user education Guide;
- to facilitate institutional exchange of course materials, guidance kits, programme packages, etc., used in user education programmes;
- to arrange for the placing of library and information personnel having responsibility for user education programmes in appropriate institutions; and
- to evaluate user education programmes.

(b) Initially, the survey may be carried out as a pilot project confined to a particular category of users, e.g. college students, or extension workers, and based on the experience gained, the survey may then be extended to cover a wider range of information users.

(c) The guidelines mentioned in 1. above could be amended in the light of the findings of the survey.

Design and Development of User Education Programmes

4. It is desirable to involve users in the design of user education programmes.

5. The expertise of subject specialists, specialists in instructional methodology and information specialists should all be used in designing, developing and implementing user education programmes.

6. User education programmes should be flexible and have built-in feedback mechanisms to provide for their continuous evaluation and adaptation as warranted by the user groups and the information environment.

7. Unesco's user education programmes should mainly be oriented to and preferably be organized in, developing areas, and increased funding should be allocated by Unesco for such programmes.

Sensitization of Managers, Planners, and Policy Makers

8. Sensitization of managers, planners and policy-makers to the value of information and information systems may be done:

- through the selective use of case histories of gains from information use and loss from non-availability of information;
- through demonstrations of services of operating information systems and services to managers etc., using specific information problems they may have on hand;

- using supporting arguments based on data on information system cost, and returns thereof; and
- using other marketing methods.

9. Unesco, under its UNISIST programme, may prepare material that can be used in developing countries to sensitize managers, policy makers, and planners on the value of information and information systems. These should also contain case histories illustrating such value and impact of information.

Continuing Education of Teachers involved in User Education

10. Unesco-UNISIST should, in association with other national, regional and international bodies, arrange for and support international, regional, and national seminars, workshops, courses, and teach-in-sessions for teachers involved in user education, particularly in developing countries, as a continuing education programme.

Survey of User Needs

11. Investigation of user needs should be designed to provide qualitative as well as quantitative information on user behaviour, identify user needs, inadequacies of the information sources and services used, etc., so as to facilitate the developing of appropriate user education programmes to suit different user group needs and behaviour patterns.

12. In making user needs surveys in the industrial sector, special attention should be paid to the differentiating characteristics of user categories, in industries and associated sectors, their wide-ranging and complex information needs, information sources, communication channels (e.g. informal and person-to-person contact), the use of information in the decision-making process, etc.

13. Unesco and other international bodies and national bodies concerned with user education programmes directly and with the planning and development of national information systems and infrastructures, should support in-depth research in user needs studies and in the methodologies used thereof.

Unesco User Training Guide

14. The Unesco-UNISIST User Training Guide should be tested as widely as possible, in real world situations, with different target groups -- among scientists, engineers, technologists, and others using scientific and technical information -- evaluated according to appropriate criteria, and modified as necessary. Unesco should assist developing countries in such testing and evaluation programmes.

V. CONCLUDING SESSION

The draft report, including the recommendations, was presented, discussed and recommended for finalization, incorporating the suggestions.

The Seminar adjourned at 5.30 pm on 21 October 1976, after a vote of thanks.

LIST OF PARTICIPANTS

BINGGELI, Mrs. M.-H.	INIS Section, IAEA, Kärntner Ring 11, P.O.B. 590 A-1011 VIENNA, Austria
BURIAN, Mrs. K.	The Scientific and Technical Research Council of Turkey Director, Documentation Centre (TURDOK) Atatürk Bulvari 221 ANKARA, Turkey
CARACCIOLO DI FORINO, Prof. A.	Universita Prodeo ROME, Italy
DAVID, Mrs. A.	Directrice du Centre de Documentation, Institut Francais des Combustibles et de l'Energie, 3, rue Henri Heine 75016 PARIS, France
DISALVO, Mr. J.	Associate Professor Indiana University Northwest Division of Public and Environmental Affairs 3400 Broadway, GARY, Indiana 46408, USA
DROOG, Mr. J.	Head, Dept. of Education and Training Nederlands Orgaan voor de Bevordering van de Informatieverzorging (NOBIN) Burg. van Karnebeeklaan 19 's-Gravenhage, Netherlands
EVANS, Prof. A.J.	University Librarian, The Library University of Technology LOUGHBOROUGH, Leicestershire LE11 3TU, UK
GARCIA TORRES, Ing.A.	Sub-Director INFOTEC-CONACYT San Lorenzo 153, 11° Piso, MEXICO 12, D.F., Mexico.
GRAY, Mr. J.C.	Head of Research and Development Dept. British Library Sheraton House, Great Chapel St. LONDON W1V 4BH, UK.

KAMAU, Miss I.	Assistant Science Secretary, National Council for Science and Technology Ministry of Finance and Planning, P.O.B.30007 NAIROBI, Kenya
LAZAR, Prof. Dr. P.	Director General, Hungarian Central Technical Library and Documentation Centre Reviczky u. 6, P.O.B. 12 BUDAPEST, I428 . - Hungary
MACERA, Dr.	Istituto Italo-Latino Americano, 1, piazza G. Marconi, ROME-EUR, Italy
MARTINELLI, Mrs.M.T.	AGRIS Coordinating Centre FAO, Via delle Terme di Caracalla 00100 ROME, Italy
MENOU, Mr. M.J.	Information Science Consultant 12, rue Dautancourt 75017 PARIS, France
MUNETIC, Mr. T.	Training Programme UNEP/IRS UNEP, P.O. Box 30552 NAIROBI, Kenya
NEELAMEGHAN, Prof. A.	Professor and Head Documentation Research and Training Centre (DRTC) Indian Statistical Institute 112 Cross Road 11, Malleswaram BANGALORE 560003, India
ONDARZA LINARES, Prof. F.	Istituto Italo-Latino Americano 1 Piazza G. Marconi ROME-EUR, Italy
OPARE-SEM, Mr.	Assistant Secretary, Head of Information, Documentation and Publication Unit, Council for Scientific and Industrial Research, P.O.Box M.32 ACCRA, Ghana
PERCIBALLI, Ms.	AGRIS Co-ordinating Centre FAO Via delle Terme di Caracalla 00100 ROME, Italy
PETRUCCI, Ing. A.	Consiglio Nazionale delle Ricerche (CNR) Laboratorio di Studi sulla ricerca e sulla documentazione Via Cesare de Lollis 12 00100 ROME, Italy

RAITT, Mr. D.I.	Space Documentation Service ESRIN Via Galileo Galilei 00044 FRASCATI, Italy
ROZENSTROCH, Mrs.	Bureau national de l'information scientifique et technique (BNIST), Ministère de l'Industrie et de la Recherche 8-10 rue Crillon 75194 PARIS CEDEX 04
SAMAHA, Mr. E.	Director, Scientific Information and Documentation, National Council for Scientific Research BEIRUT, Lebanon (temporary address : c/o Mr. H. Samaha, 135 bis Bd. Montparnasse 75006 PARIS, France)
SANTANCHE, Prof. G.	Istituto Italo-Latino Americano 1 Piazza G. Marconi ROMA-EUR, Italy
SWEENEY, Mr. G.P.	Director, Technical Information Division, Institute for Industrial Research and Standards (IIRS), Ballymun Rd DUBLIN 9, Ireland
VILLARS, Mr. J.A.	Assistant Librarian Council for Scientific and Industrial Research P.O. Box M.32 ACCRA, Ghana
WESLEY-TANASKOVIC, Mrs. Prof. I.	Director Institut de Documentation médico-militaire Ul. Pasterova 3 11000 BELGRADE, Yugoslavia
WILSON, Dr. T.D.	Senior Lecturer in Information Studies, University of Sheffield Postgraduate School of Librarianship and Information Science, Western Bank, SHEFFIELD S10 2TN, UK

ITALIAN OBSERVERS :

Dr. M. VALENTE (AIB)
Dr. M.P. CAROSELLA (CNR)

UNESCO SECRETARIAT

Mr. J. Tocatlian
Division of Scientific and Technological Documentation and Information

REVISED AGENDA

I a) Opening of the seminar - F. Ondarza Linares, A. Petrucci, J. Tocatlian
b) Introduction to scope and objectives of seminar - J. Tocatlian

II Measurement of information use and user needs as a basis for training programmes - T. D. Wilson

III Levels of training and education.

a) User education in academic institutions including secondary school level and university; - A. Neelameghan

b) training of users of libraries and documentation services; - K. Burian

c) user training in the context of a technical information service; - G. P. Sweeney

d) sensitization of decision-makers, policy-makers and managers - M. Menou

IV Means and methods of training users

(Courses, short workshops; guidelines, publications, etc., plus discussion of the UNISIST Guide) - A. Evans

V User training as a component of national information policy:

Necessary provision for implementation of national user education policy (functions of a UNISIST focal point, role of the university, other educational institutions and professional organizations) - J. Gray

VI A possible long-term UNISIST programme for user training

VII Closure of the seminar

R E C O M M E N D A T I O N S

of the

UNISIST Seminar on the Training of

Users of Scientific and Technical Information :

Analysis and Evaluation of UNISIST Guidelines

October 14-15, 1976
Bangkok, Thailand

The Seminar having discussed all significant problems relative to user education and training, unanimously resolved to adopt the following recommendations:

The Seminar, having emphasized the importance for all present and potential users of scientific and technical information to better recognize and formulate their information needs and effectively utilize and assess the libraries and information systems and services available to them:

1. Stresses the need for the Asian National Members of Unesco to establish through the national focal points effective mechanisms - including the necessary provisions in the national information policy - for organizing user education and training programmes for the benefit of various categories and levels of user groups, taking into account national priorities.

2. Recommends for immediate consideration of national focal points the following possible initial steps:

   (a) Determine the extent of knowledge among all categories of users about how to obtain and use information.

   (b) Determine, as a result, which levels, types and techniques of training should have priority, given the available resources.

(c) Ensure at the same time that (i) the leading guides to the literature can be made available for training purposes, (ii) access is obtainable to this back-up literature, and (iii) the potential teaching resources in the country and neighbouring countries are listed and evaluated.

(d) Determine, in the light of the actions above, which institution(s) should be involved in the training programme and what form of technical assistance, if any, should be sought.

3. Recommends the wide distribution and utilization of the Unesco Guide entitled: "Education and Training of Users of Scientific and Technical Information - UNISIST Guide for Teachers".

4. Recommends that strong emphasis be given in the UNISIST programme to the promotion of user education and training, and more specifically to the assistance to Member States in developing and organizing such training programmes.

5. Recommends that strong emphasis be given by Unesco, in its UNISIST programme, in collaboration with appropriate organizations, to the education and sensitization of, on the one hand, administrators, planners and policy-makers, through on the other hand, the extension workers in agriculture and industry.

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SC-33

THE INVESTIGATION OF INFORMATION USE AND USERS' NEEDS AS A BASIS FOR TRAINING PROGRAMMES

by

T.D. Wilson
University of Sheffield

1. Introduction

User training programmes commonly take two main forms: a) introduction to the resources of a specific library, with instruction on how to gain access to these resources; and b) introduction to the total bibliographical apparatus of a given subject field. In neither case does much attention appear to be paid to users' "needs" as a basis for designing these programmes. This is a curious situation when there is a comparatively large amount of information available on how workers and students in different disciplines seek information.

This paper is concerned with a) the definition of user groups and information needs; b) the functions of information needs investigations; c) methods of investigation; d) the bases of an investigation; and e) an illustrative case-study. In general a note-like form of presentation is used in order to keep within the space limitations set.

2. User groups

It may seem elementary to say that before an investigation can be undertaken there needs to be some definition of the target group, but the idea of 'the user' can be a trap for the unwary. It conflates into a single concept a wide range of individual behaviour and, to a certain extent, it may be a statistical construct with no correspondence in reality.

Useful sets of categories have been devised for defining groups of interest: for example, Havelock (1973) writes of four subsystems of the 'knowledge macrosystem:' (See Annex I)

> research subsystems,
> development subsystems,
> practice subsystems, and
> consumption subsystems.

Within these he identifies specific sub-groups; for example, within the practice subsystem there are:

> the practice professions,
> the product organizations, and
> the service organizations.

Clearly, the same kind of analysis can be applied to fields other than science and technology. (See Annex II)

3. Information needs

The two concepts 'information needs' and 'information-seeking behaviour' have often been confused in research and writing. There is a difference and it can be illustrated by reference to the kinds of questions to which the two concepts give rise. (See Annex III)

Finding out about information NEEDS involves asking:

Does this person or group need information?
Does he know he needs information?
What kind of information does he need?
What factors are likely to influence needs?

These questions are difficult to answer because they imply that the person who needs information may not have defined that need and so may find it difficult to think of information in the same terms as the researcher. Whether one pursues questions of this kind depends upon -

- how well the target group is defined, and
- whether it is really necessary to have answers to such questions.

In other words an interest can be claimed in only those who have defined information needs for themselves. Attention can then be given to information-seeking behaviour.

Finding out about INFORMATION-SEEKING BEHAVIOUR involves asking:

What does he do about his need?
How does he select information resources?
How does he carry out a search for information?
What factors are likely to affect this behaviour?

This is the area that we are usually concerned with if we are seeking information to guide the development of user-training programmes. In effect, through the experience of librarians and information workers, the first set of questions has been asked and answered at the commonsense level of understanding. Through this level of understanding the opinion is formed that some training is necessary and that some additional information is necessary before such training can be planned.

4. The functions of an investigation relative to user-training

The function of information needs (or information-seeking behaviour) investigations relative to user education programmes is to help to provide answers to the basic questions which the designer of such programmes needs to ask:

1: For WHOM is the training intended? A user needs study can help in defining the target group and in drawing attention to subgroups with special needs. For example, a study by Törnudd (1959) of Scandinavian research and development workers revealed that those working in research institutes were less able to keep up with new developments in their field than their colleagues in universities or in industry. This suggests that training directed at that sub-group might have most impact.

2: WHY is training required? A user needs investigation can provide or support arguments for the introduction of training programmes by showing the extent of need and, by comparison between informed and ill-informed groups, by suggesting the general benefits that might result from training.

3: WHAT is the training programme intended to accomplish? User needs investigations can help to set realistic objectives for a training programme by helping to identify precise areas in which knowledge of information sources or information-seeking procedures is lacking. Objectives set on this basis can be defended much more strongly in discussion with agencies which may be providing the funds for a training programme.

4: WHERE should the training take place? A consideration of the earlier comments on user groups will lead to the realization that different locations may need to be considered for different user groups. For some groups with a high awareness of information needs a national or regional course may be possible; for groups with a lower level of awareness it may be necessary to implement courses within individual organizations.

5: WHAT training methods should be used? The deeper understanding of the user group's needs attained through an investigation can lead to a better appreciation of what instructional methods are likely to have most success.

6: WHEN should training take place? An understanding of work schedules and cycles will enable training to be fitted into the normal activities of the target group with maximum effectiveness.

Clearly, it cannot be claimed that <u>all</u> of these questions can be answered at one and the same time by a single investigation but, if one bears in mind that they are questions for which some input from the users is necessary, then all stages of an investigation may help to provide parts of the answers.

5. Methods of investigation

There is no space here to give an extensive account of the range of investigative methods which can be used to study users' needs or their information-seeking behaviour. In any event the literature of sociological research methods is very extensive and in the field of information use there are many examples of the use of the most common methods. For information on these reference can be made to the Annual Review of Information Science and Technology which in all but the present volume has a chapter on users' needs. Older reviews which are still valid but difficult to obtain are those by the Bureau of Applied Social Research, Columbia **University** (1960) and by Paisley (1965). What I shall try to do, therefore, is to make some general remarks on the categories of methods and on factors to take into account in choosing methods.

Investigative methods in sociological research (and I take the study of information users to be within that field) can be divided into two broad categories: quantitative methods and qualitative methods. In recent years some sociologists have become disenchanted with quantitative methods and have turned to qualitative methods (sometimes called 'field research') to obtain data. Conflict has arisen within the field over the nature and purpose of research: quantitative methods have come to be associated with the 'positivist' or 'scientistic' approach to social research, qualitative methods with the 'phenomenological' approach which is concerned with understanding human behaviour from the point of view of the subject's own frame of reference. In my opinion both approaches have their place in user research and I have given the issue some space here only because you need to be aware of the distinction when you approach sociologists and research methodologists for guidance.

The two broad types of methods can be subdivided as follows:

Quantitative methods

- self-completed questionnaires, distributed by mail or in some other manner;
- interviewing, using highly structured interview schedules;
- experiment (loosely used, in the sense of monitored innovations in information service delivery);
- data collection from records of activites, e.g. library issue records.

Qualitative methods*

- observation, sometimes divided into 'participant' and 'non-participant' observation;

- analysis of personal documents, such as diaries, letters, and autobiographies, and of 'official' documents such as syllabuses, job descriptions, internal organizational policy documents;

- unstructured, open-ended interviews.

The first point to be made in relation to the choice of methods is that they are not necessarily alternatives: circumstances may dictate that either a specific method must be used, or that a combination of methods must be used. For example, if you need to obtain information on, say, engineers throughout a country and funds are limited then probably the only method to adopt will be the mail questionnaire. If you are interested in a smaller population and the aims of the study are very well defined it may be desirable to use a combination of methods.

The second point is one that impinges upon the first; the method you use must depend upon what you want to know. Zelditch (1962) identifies three 'primary' methods and, in the **Figure** (as illustrated at the end of this Paper, on Page **15**) he indicates which method is best for the kind of information the investigator is trying to obtain.

(See Figure 1 on Page 15)

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* The term "qualitative" is somewhat misleading, since, clearly, the methods subsumed under the term can be used to produce quantitative data. The term is used to indicate those methods of research which enable the researcher to get closer to the sources of data and thereby enable him to take into account the subject's own perceptions of the problem under investigation. Advocates of these methods claim that quantitative methods cannot be used for this purpose and that they reflect concern with a natural science model which is inappropriate for social phenomena.

The criteria used by Zelditch to define the 'goodness' of a method are:

- informational adequacy: meaning accuracy, precision and completeness of data; and
- efficiency: meaning cost per added input of information.

Thirdly, the importance of the method of data collection should not be overemphasized at the expense of the logical definition of the categories of data that are being sought. This point is strongly emphasized by the report of the Bureau of Applied Social Research referred to above. Figure 2 is derived from that report:

Figure 2

Basic data type in user studies:

A - exposure to channels of communication

- delineation of units of information-receiving behaviour:

  - exposure vs. non-exposure; (e.g. Has he read a given journal at all?)
  - number of acts; (e.g. How often has he read it?)
  - time consumed; (e.g. How many minutes has he devoted to it?)
  - messages received; (e.g. How many facts has he learned from it?)

B - the purpose or function of exposure

- ways of classifying functions

  - by the scientist's future activities;
  - by the type of message;
  - by the place of the message in the course of the scientist's total information-receiving activity.

Clearly, in the case of a study directed towards the training of users, the extent to which questions on these two types of data will need to be adapted to the purpose of the study will be a matter for careful consideration.

Finally, it cannot be emphasized too strongly that the conduct of user needs investigations is a skilled task, requiring expert guidance if it is to be carried out by amateurs in the field of social research methods. Unless such guidance is available simple errors may be made which will invalidate the result of the investigation and, if the study is part of a larger effort, such as a national programme of research, this may prejudice the results of that effort. The areas within an investigation which may affect reliability and comparability include:

- definition of the population or target group;
- the use of appropriate sampling methods;
- adequate definition of the categories of data being sought;
- choice of analytical procedures.

5. Bases of an investigation into users' needs relative to user training

a) any investigation should have regard to the 'information environment' surrounding members of the target group, i.e., the library and information resources actually available, rather than those theoretically available;

b) the corallary to this is that any study should be preceded or accompanied by a survey of available resources and their accessibility;

c) any investigation should have regard to the existing modes and levels of user training and the extent to which they have been used by members of the target group;

d) any investigation should have careful pre-definition of the geographical, organizational and subject discipline boundaries of the target group or groups as this will influence the conduct of the study

e) the aims and limits of the investigation require careful definition: such questions should be asked as - Is the study intended to reveal users' attitudes towards information or to show how they use given resources? Is the study intended to guide training policy locally or more widely? Have any previous studies been carried out on similar target groups and, if so, do they direct attention to particular problems and issues? If the study is a regional or country-wide one, are the different areas or organizations comparable? - and so on;

f) ideally, then, a total programme requires:

- an analysis of needs in so far as they can be inferred from documentary sources (such as syllabuses in the case of students or official documents such as job descriptions in the case of other groups), from discussions with key individuals, and as they are stated by members of the target group;
- an investigation into the present level of understanding of information sources and their use;
- an investigation into the present pattern of use of library resources and services;

- a study of the normal work behaviour or the target group to discover how far this behaviour allows for information use;
- where feasible, a study of the use of services offered on an experimental basis;
- a study of the efficacy of different methods of user training.

Naturally, not all of these activities are embodied in all users' needs investigations but in any total programme for a given country or region they should be covered at some time.

7. Case studies

A. The Hamline University project (Mavor & Vaughan, 1974)

This project is particularly interesting for its integration of: a) a users' needs study; b) the employment of information specialists in a university setting; c) instruction in the use of bibliographic resources and in searching procedures; d) assistance to faculty in the choice of reading for courses; e) improving the system of documentary provision; and f) the ongoing evaluation of the whole system.

There is insufficient space here for a full description of the project but the procedures for the assessment of users' needs are of particular interest. The academic course was selected as the unit of analysis and several interviews were held with the faculty member responsible for each course to determine the 'tasks' associated with the course for both the faculty member and the student. An interview guide was evolved for this part of the study and this covered such topics as: objectives of the course, tuition methods used, selection of topics to be covered, selection of reading material and audio-visual aids, and so on.

Following this analysis of tasks further interview sessions were conducted throughout the course to determine the information needs associated with each course task. These sessions provided the information specialist with a basic understanding of information needs to enable him to deliver effective information services to the faculty member.

Procedures for assessing the needs of students followed a similar pattern of interviews to establish such facts as existing subject background, the time frame in which the material was needed, and the type and level of material best suited to the need. In addition the information specialist spent some time on each course in actual class sessions.

An integral part of the subject specialists' work was teaching:

> '...suggesting bibliographic tools, providing guidance in the use of these tools, and aiding in the final screening and selection of material to be ordered.'

B. A study of some Open University courses and related students' needs.

Figure 3 below sets out the stages and methods used at each stage now being carried out in three regions of the Open University in relation to four third-level courses which require the student to gain access to specialized sources of information. The ultimate aims of the project are:

- to help OU course teams to produce realistic reading lists for students;
- to assist regional tutorial staff in giving guidance to students on the availability of resources;
- to provide guidelines for the possible preparation of teaching packages for these courses specifically devoted to finding and using specialized information resources.

Thus, providing guidance on information use in one of the principal aims of the research.

Figure 3

	Questions	Methods
Pre-survey stage.		
	1) What are the general course objectives?	Analysis of course handbooks and teaching units.
	2) What library/ information resources are needed to help students attain objectives?	
	a) explicit; b) implicit.	
	3) What resources are accessible to students in their areas?	Identification of libraries and other information sources and their mapping.
Survey stage:		
	3) - same question	Creation of a 'test file' of items from reading lists, etc. and checking in selected libraries.
	4) To what extent are available resources known to students?	

Questions	Methods
5) To what extent are they used?	Interviews and mail questionnaires.
6) Which services are used?	
7) With what success?	
8) What obstacles are there to use?	
Post-survey stage	
9) What can be done to overcome obstacles/ problems? - by course teams, - by tutors, - by students, - by regional offices, - by librarians.	Analysis of data from preceding stages. Further interviews/discussions with interested parties.
10) How might suggestions be implemented?	

8. Conclusion

By way of conclusion it seems worthwhile to make two very general points and repeating some of the warnings:

a) there is no 'quick and easy' method of obtaining information on users' needs or their information-seeking behaviour, nor is there any single combination of investigative methods which will suffice for all situations;

b) time spent in planning an investigation within the context of a total programme of user training and with specific training objectives in mind will be time well spent.

As to the warnings:

DO define the user group of interest carefully, so that there is a strong probability that its training needs will be homogeneous. The corollary to this is that if the study reveals sub-groups with specific needs they may need to be catered to specifically.

DO distinguish between information NEEDS and INFORMATION SEEKING and decide which of these areas is of real significance for the overall programme.

DO identify the specific training issues upon which you need guidance and design your study accordingly.

DON'T choose investigative methods that are inappropriate to the kind of data you need. It may be much more appropriate and possibly cheaper to sit down and analyse documents than to carry out a field investigation.

DO define the categories of data you need to collect and choose measures for those categories that are a) relevant and b) feasible.

DO seek expert guidance on the conduct of an investigation and on the analysis of the resulting data.

DON'T conduct a user needs study in ignorance of the resources that are available, accessible and already used.

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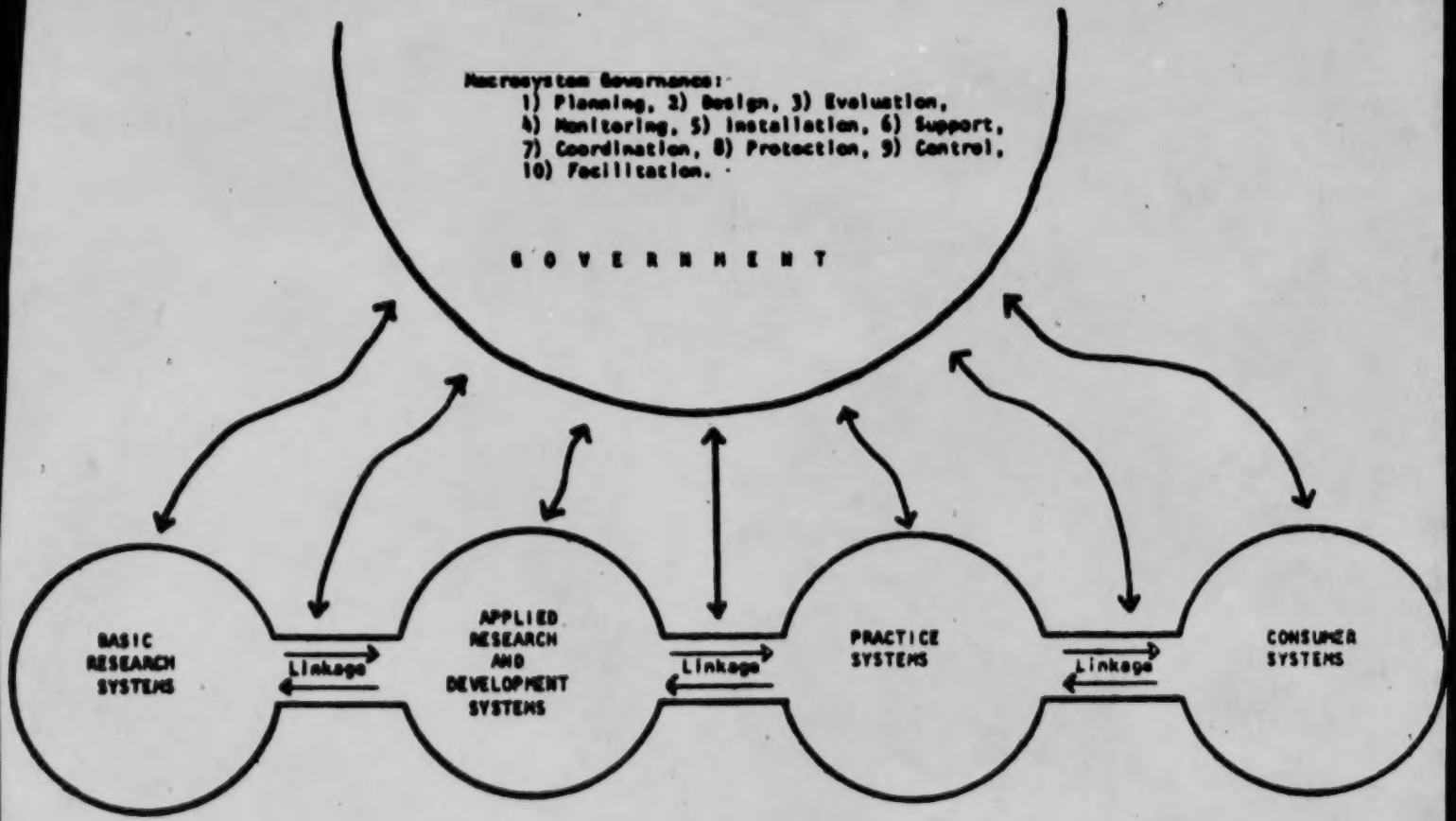
Annex I

A Functional Framework for Viewing DEU Macrosystems

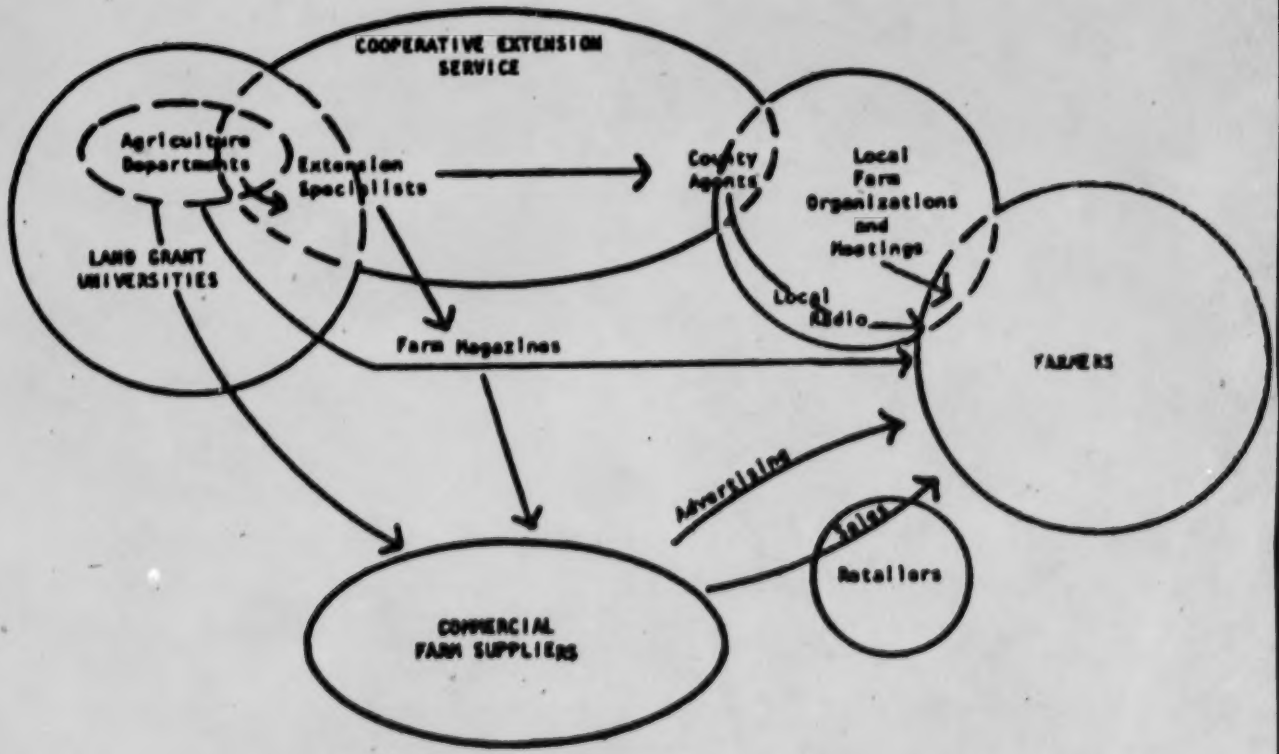


Any or all of the 10 functions of governance can be *delegated, contracted out*, left to the *self-governance* of each subsystem, or left to the play of "natural" forces.

(Havelock, 1973)

Annex II

Agricultural Extension in the United States: An Example of a Formal Macrosystem for Knowledge Production, Dissemination and Utilization



(Havelock, 1973)

Annex III

A. Information needs

Does he need information?

Does he know he needs information?

What kind of information does he need?

B. Information seeking behaviour

Does he do anything about his need?

How does he select information resources?

How does he perform a search?

Influencing factors

Social role.

Level of performance of role.

Problem recognition-abilities.

Nature of specific problem.

Environment.

Urgency of problem.

Benefit of taking action.

Recognition of information resources.

Expectation of success.

Subjective factors.

Knowledge of information resource

Ability to formulate search strategy

A framework for the analysis of information users' needs

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Figure I

INFORMATION TYPES	METHODS OF OBTAINING INFORMATION		
	ENUMERATIONS AND SAMPLES	PARTICIPANT OBSERVATION	INTERVIEWING INFORMANTS
FREQUENCY DISTRIBUTIONS	PROTOTYPE AND BEST FORM	USUALLY INADEQUATE AND INEFFICIENT	OFTEN, BUT NOT ALWAYS, INADEQUATE EFFICIENT WHEN ADEQUATE
INCIDENTS, HISTORIES	NOT ADEQUATE BY ITSELF-NOT EFFICIENT	PROTOTYPE AND BEST FORM	ADEQUATE WITH PRECAUTIONS - EFFICIENT
INSTITUTIONALISED NORMS AND STATUSES	ADEQUATE BUT INEFFICIENT	ADEQUATE, BUT INEFFICIENT, EXCEPT FOR UNVERBALISED NORMS	MOST EFFICIENT AND HENCE BEST FORM

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A NOTE ON SOME ASPECTS OF THE EDUCATION AND TRAINING OF USERS OF INFORMATION IN HIGH SCHOOLS AND COLLEGES

by

A. Neelameghan
Indian Statistical Institute
Documentation Research and Training Centre

CONTENTS

1 Introduction

2 Premises

3 Policy for user education programmes

3^1_2 Academic policy
3^2 Library and information policy

4 Apathy and resistance

5 Planned programme necessary

6 Recommendations

7 References

1 INTRODUCTION

For the purpose of this note, user education and training includes any effort or programme for providing guidance and instruction to users, individually or collectively, with the objective of facilitating their effective and efficient use of library and information system(s). Thus, such a programme may cover one or more of the following:

- orientation to the layout, location of materials and facilities, and other physical aspects of library and information systems.
- use of the library catalogue and other information access and finding aids, including computer and telecommunication systems.
- use of the information resources and facilities in general or for a specific purpose, available in and through, the library and information system/network.
- experience in comprehensive search for information (library research).

- using library as a teaching centre, evolving the academic programmes around and from the library and information system (library college concept).

In the academic environment - high school, college, and university - user groups may be categorized as follows:-

I STUDENTS

- High School students
- Freshmen
- Undergraduate majors
- Graduate students
- Post-graduates/research students

II FACULTY

- Undergraduate teaching
- Graduate teaching
- Post-graduate teaching
- Research guidance
- Own research activity
- Academic administration

III ADMINISTRATIVE STAFF

IV OTHERS

In this note the focus of discussion will be student orientation and guidance.

The effectiveness of user education and training, in a given context, depends, in large measure, on the perception of the role of the library and information system in academic life by the faculty, administration, and information personnel. There is a general consensus on the value of the library and information system as a support to the academic programme. But there is a wide spectrum of views among librarians, faculty and administrators and within each of these groups, as to the precise role of the library and information system. The views range from considering the information system as a resource centre, through that of its having a teaching function, to considering that the academic programme should centre round and evolve from the library (library college idea).

In general, library and information personnel, faculty and administrators need to appreciate that user education has functions similar to that of education in any area -- namely, to help the individual adapt to his changing environment. This implies equipping the trainee with attitudes, techniques, and skills for maintaining an accurate orientation to the environment, to reality, minimizing false-to-fact "knowledge", for checking his cognitive "maps" against the "territory" of experiences.

2 PREMISES

Perception of the need for guidance and instruction in the use of information systems arises from a variety of experiences and interrelated premises such as the following.

1 "User needs" has been a major concern of library and information personnel in recent years as is evidenced by the increasing number of surveys, papers, conferences, etc devoted to it. The objective of studies on user needs is mainly to develop criteria and guidelines for designing optimal information systems. A spin-off from such studies is the realization that few users know how to use information systems to advantage. The perfect information system, when developed, would of course, afford its maximal use with minimal difficulty. But such systems are a long way off in realization, and in the meantime user education and training could help better use of the existing less-than-perfect information systems.

2 In the academic environment, effective use of the library and information systems can lead to better student performance. Studies show that the academic community familiar with the working of information systems can use them to their advantage, whereas those who are unaware of or do not know how to use these systems effectively can gain little benefit from them. Therefore, user guidance and education are deemed to benefit students, teachers, and researchers.

3 Academic library and information systems tend to become complex in attempting to meet the growing needs and demands of users through incorporation of the developments in information handling methods and technology. Information is communicated increasingly through non-book media. On-line access to data bases on campus, off-campus, and even at global distances is becoming a familiar feature in some countries. Problems and difficulties in using information systems vary from one person to another. Some constraints are system-specific, others are user-specific. The new generation of students growing with the newer systems will, in future, be capable of more effective use of them. But there exists a large proportion of the academic community for whom the sophistications are entirely new and needs orientation and guidance in their use.

4 In the costing of research, academic programmes, etc, and in the assessment of information system efficiency and effectiveness an important factor taken into account is the time taken for information search, access, and document delivery. Therefore, use of information systems should be made as productive as possible. Orientation, guidance and instruction in the use of information systems and services could increase the productivity.

5 Often faculty members are only vaguely aware that the bibliographic tools commonly used by them represent only a small part of a large network of bibliographical services and systems. Expert knowledge which arises out of years of study and experience in a specific narrow field may be mistaken for a comprehensive knowledge and bibliographical control of the literature of the umbral and penumbral areas of their interest. Carefully planned exposure of the faculty members to the wide range of information sources and facilities in their respective subject-fields easily points up the limitations of the extent of coverage of their self-documentation efforts and motivates their acceptance of information services.

6 Faculty members may not be fully aware of learning theories and instructional methodologies involving library and information resources. They may be indifferent to such possibilities. Library and information personnel can make a useful contribution in this respect by demonstration if done in an unobstrusive and discrete way.

7 In the undergraduate major and graduate levels the library has a useful role in developing the intellectual and scholarly ability of students. But neither the faculty nor the students may be aware of this. A user education programme would be a first step in gaining the faculty's confidence in the role and capacity of the information system as a support to their own efforts in developing scholarly attitudes in students.

8 It is generally accepted that efficiency and productivity in any field of activity - e.g. business, engineering, medical practice - can improve through effective use of information and information systems. However, a practitioner has little time for learning the effective use of information systems. Therefore, it is expedient that guidance, instruction and experience in using information systems is provided during his school and college career. Further, the academic environment is more conducive to the conduct of such guidance and instructional programmes than would be a business house, engineering concern or a hospital environment.

3 POLICY FOR USER EDUCATION PROGRAMMES

3.1 Academic Policy

In order to facilitate the effective operation of user education programmes, it is highly desirable that academic policy covers, among other things, the following.

1 Considering the acquisition of experience and proficiency by students at all levels in the use of library and information systems as an educational objective to be achieved.

2 Considering the education and training in the effective use of library and information systems as an integral part of the education programme.

3 Designing the curriculum in such a way as to provide students adequate opportunities for self-instruction through independent study involving use of library and information systems and services.

4 Making work on a project involving guided research and independent enquiry as a prerequisite for graduation.

5 Use of instructional methods such as seminars, colloquia, workshops, clinics, etc., involving prior "library research" information analysis and synthesis, at the college level.

6 Provision of adequate funds and facilities for user orientation and education programmes as an integral part of the academic programme.

7 Inclusion of information staff in key faculty committees such as the curriculum committee in order to provide for adequate interaction and participation of the library and information personnel in the academic programmes and activities.

8 Recognizing the educational role of library and information personnel by awarding academic status to these professionals.

3[2] Library and Information Policy

The effectiveness and efficiency of user education programmes should be assured by adopting appropriate library and information policies. They should cover, among other things, the following:

1 Guidance and instruction in the use of library and information systems should be considered as an integral part of a library's functions and professional responsibilities of the information personnel.

2 The library and information system should assume a positive and active role in meeting the educational purposes of the institution.

3 In order to get the highest payoff from the library's contribution to the education programme, the library and information staff should work with and through the faculty in designing programmes to influence student behaviour in using library and information.

4 Since the potential for and nature of collaboration between library and faculty varies from discipline to discipline and from individual to individual, the library should be alert to possibilities at both levels.

5 In designing user education programmes, the library and information personnel should be sensitive to the difference in the mass approach at the school and undergraduate library and the individual scholar approach in the university library system.

6 Library activities and programmes should be so designed and the library and information staff should be of such quality that productive collaboration with the teaching faculty is facilitated. For example, the library staff interacting with the undergraduate programme, should have in addition to their professional competence in the information field, a high-level liberal arts' background, a certain commitment to the teaching enterprise and a thorough understanding of curriculum design, learning theory, and instructional methods.

7 User education programmes should be designed to be flexible - adaptable to the different student levels and faculty needs, allow the use of various instructional media and methods, include a built-in feed-back mechanism and facilitate innovation and easy implementation.

8 Library and information activities and programmes should be derived from and reflect, the changing concept of library and information systems - e.g.,

a) Their dynamic participative role in the educational programme;

b) Their future information environment and future task orientation;

c) As a system and network in which information flow to points where it is needed rather than as a 'building' to which people come for information;

d) Their user-centred and service-centred, rather than technique-centred activities,

e) Their ability to use multimedia in information transfer, rather than being solely book-based.

4 APATHY AND RESISTANCE

While there is a fairly widespread appreciation of the need and value of user education and training programmes in the academic environment, there are but a few such programmes really successful in practice. In fact, one often encounters apathy and even resistance to user education programmes from students and faculty. Reasons for this include the following:

1 Students and faculty tend to consider library instruction as something extracurricular and not germane to the educational development of students.

2 Complacency arising from the belief that satisfactory experiences in the school library gives adequate competence in the effective use of the college library and information systems. This may result in or from an inadequate knowledge of the range of college library resources and services and of the difference in the school and college educational programmes.

3 The persistence of the concept that a library lecture given during the school 'library hour' or on entering college will solve or build adequate competence for solving all information search problems for all time.

4 The misconception that ability to use the library catalogue is all that one needs for effectively exploring, accessing and using library and information resources. Millicent Palmer points out that "The persistent Myth of the Card Catalog is ... a product of our past instruction emphasis, an emphasis that may have been relatively valid in the day of "The Book", before the literature of journals, reports, government publications, conference between informed and uninformed scholars and students."

5 The arrangement of the traditional library instruction centering around the card catalogue, classification, various indexes and reference books, including sometimes history of books and libraries, and practical hints on searching for information and telling students what they are expected to know, and assigning them some practice exercise often of no practical value and unrelated to their courses, appear to give some students a sense of security and competence in their approach to library and information systems. This feeling may be a false one and inhibit them from exploring the information sources further which they might have done otherwise.

6 Martha Hackman further points out that: "Too often library instruction has served as a sort of procrustean device for filling students into a rigid system designed without consideration for their needs. The motives behind many such programs have had more to do with publicity, economy or enhancing the librarian's image as a member of the teaching faculty than with the education of students. By and large, library instruction has been impersonal, mechanical, and above all, dull."

These factors individually and collectively not only produce no motivation to take the orientation courses and programmes, but also tend to raise apathy and resistance in students and faculty.

5 PLANNED PROGRAMME NECESSARY

User education programmes should be carefully planned and implemented in relation to the categories and levels of the target group. The aim should be to stimulate the student to take responsibility for his own learning. Individual attention and guidance based on an understanding of the individual differences in library experience, learning ability and specific needs and interests should be preferred to a one-shot mass lecture. Features of a successful user education programme, e.g. Monteeth College and Earlham College, USA, are: It is course-related and focussed on specific topics or problems being handled by the student. It is demonstrated, that is, the library staff work through an information search analogous to the one assigned to the student, so as to make the presentation as concrete and relevant as possible, using appropriate media. It is gradated, that is, the instruction is in several levels e.g. pre-freshmen, freshmen, beginning major, and senior - each stage being built on, but not repeating, the work done in the earlier level. Library search guidance should be integrated with academic programmes and curricular activities involving tutorials, seminars, term papers, individual study and independent inquiry by the student. Various methods and media of instruction should be used with imagination individually and in combination depending upon the characteristics of the target group and the stage of instruction. The following are some of the instructional methods and materials used in academic library instruction as reported in the Nelum survey:

Tours

- Conducted tours
- Self-guided tours
  - using printed material
  - using casettes

Lectures to classes
Workshops, clinics, seminars

Telecourses

Non-print media

For groups:
- Slide/tape presentations
- Slides
- Tapes and casettes
- Television
- Filmstrips
- Films
- Multiscreen presentations

For individual use:
- Slide/tapes
- Cassettes
- Filmstrips
- AUDISCAN
- Touchstone Access Carrel
- Programmed machines

Printed media
- Subject bibliographies
- Student handbooks
- Faculty handbooks
- Miscellaneous handouts
- Programmed instruction
- Programmed kits
- Self-instruction brochures

6 RECOMMENDATIONS

1 National science information policy should include user education and training as a policy objective. The Unesco-UNISIST proposals on Information Policy Objectives (SC/74/WS/3, April 1974) recommends three basic tasks for a national focus in relation to information user education. Basic training, discussion of user needs studies, and user involvement in experimental services. These recommendations should be implemented through the national focal point in each member country.

2 Unesco, under its UNISIST programme, should formulate detailed guidelines on user education policy and programmes.

3 The UNISIST Guide for teachers, after completion of the pilot tests, should be examined carefully to identify elements applicable to the academic environment. If necessary, modifications and/or additions should be made and a separate manual or handbook on user education and training, particularly in science-technology areas, and on the conduct of such programmes in schools and colleges, should be made available.

4 It is desirable that Unesco under its UNISIST programme arranges, preferably through the national focal points, UNISIST national committees and other appropriate bodies, a survey of the major user education programmes available in member countries. The questionnaire proforma for the purpose should be designed keeping in mind the objectives of the survey-- namely, (i) to facilitate exchange of information among institutions on user education programmes, (ii) to identify characteristics of successful programmes for different user categories at different levels, (iii) to incorporate appropriate elements of such programmes in the UNISIST Guide proposed in recommendation 3, (iv) to facilitate institutional exchange of course materials, guidance kits, programme packages, etc. used in user education and training and (v) arrange for the training of library and information personnel having responsibility for organization and conduct of user education programmes in appropriate institutions where they can study, observe, and get guidance and training in the conduct of such programmes.

5 Unesco-UNISIST should, in association with other appropriate bodies, arrange for international and regional seminars, workshops, courses and teach-in sessions on user education and training.

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TRAINING OF THE USERS OF NATIONAL INFORMATION CENTRES - A CASE STUDY - TURDOK EXPERIENCE

by

K. Burian
Türdok

THE ESTABLISHMENT AND DEVELOPMENT OF TURDOK

TURDOK was established in 1966 within the frame of the Establishment Law of the Scientific and Technical Research Council. Development of the Centre during the preceding years took place conforming to the supply/demand rule and taking shape in accordance with the user needs. TURDOK has reached its present status on the line of this philosophy which I will try to explain briefly.

a. UNIVERSITIES AND TURDOK

In the first years of establishment a service had been foreseen for the research scientists. The main activity of TUBITAK during the period 1964-69 was research, and the Science Board, which is the highest decision-making organ of TUBITAK, consists mainly of scientists and researchers. Therefore the underlying idea when setting up a documentation centre was to have research-oriented services. The first attempt of the centre after five years of the development period had been to make its services known through the printed media, such as brochures and articles published in scientific papers, to the user sector. But the result, that is the number of demands for the services of TURDOK, was far from being satisfactory. The second methodology that was tried in order to stimulate the user sector was to make visits to the universities and state-owned research institutes. Although the second methodology was more promising in comparison to the printed media, it was also a failure. Soon after the visits a decrease in enquiries was observed and therefore it was deemed necessary to repeat the visits.

It was therefore concluded that the research sector and especially the scientist in universities sought TURDOK's literature search facilities only when an academic degree or prestige was in question, (e.g. to submit a paper to a scientific congress, etc.). Universities do not care very much for the applied research projects that contribute to the economical development of the country because they claim that the University has a scientific autonomy and a research scientist does as he pleases. We assume that the negative psychology or the attitude of the scientists towards industry-oriented or applied research is to avoid what we may call "the difficult side approach". This is because applied research or industry-oriented research is functional

research that usually results in a prototype or a pilot plant. Therefore the research scientists tend to prefer the theoretical (basic) research which results in the materialization of a paper; his preference is to use his facilities as a "hobby shop" rather than function-oriented research. On the other hand I would like to mention that work-shop type research also has the same dangers as "hobby shop" type research.

Another reason for the lethargy of the research sector to applied or industry-oriented research lies in the lack of organic liaison between industry and universities.

I myself, as the head of TURDOK with eight years of experience, have reached the following conclusion with regard to the matters that I have tried to explain: industry-oriented research calls for a sound information basis. Occasionally acquired information has pitfalls for such type of research. Any failure in application is unforgivable and harshly criticized. Therefore researchers should "leave no stone unturned" before launching the research project. They would then be on the safe side. I am aware that from the psychological point of view it is rather difficult to move the research scientist from a kingdom where his educational system, his personal affinities and even his curiosities, determine the environment where the live or perish law rules, as in organized research. But the generations must accept certain duties and the present generation of developing countries is bound to have this same approach, this Spartan Law approach, if their aim is to realize an economic development and industrialization era.

Another point that is in favour of industry-oriented research is this: although at the beginning the research scientist would feel as if he had stepped on quicksand, later on he would see the application of his research results and would be happy and self confident. This feeling I am sure would outweigh his preliminary anxiety.

Let us move on to our scientist who feels that basic research is his appropriate medium. He is over confident and claims that "I can find everything, every bit of knowledge that is necessary for me to build my research project on, I am unique, nobody knows anything better than I". I cannot argue with him because he didn't try other channels, nor because he had a bad experience with a so-called documentation centre; I cannot argue with him because he was not trained to recognize the vast sources of knowledge; he thinks that he grasps the whole universe of his discipline by browsing through a few dozen journals, etc. Truly, a research scientist in the right sense of the word is accepted as knowing his field best but we should also admit the exhaustive character of information services. Evaluation versus Exhaustiveness. In fact information services are not competitive to the intellectual level of a research scientist. What is most important is the synthesizing ability and creativeness that lies in the brain of the scientist and in his initiative.

The time factor is also decisive; a scientist, instead of waiting for the compilation of a bibliography or a literature survey and waiting further for the delivery of the hard copies of the relevant documents, would rather fish out from his shelves some books or periodicals. But if once he experiences the merits of an information service he can easily change his previous attitude. Unfortunately this type of scientist is in the minority. Therefore our goal should be to encourage every scientist to try the experience.

I am convinced that this attitude of the scientist towards information can be explained by the education system. Information should be embodied and inter-rated in higher education programmes and the aim should be to produce information-minded scientists and engineers.

Recently, a tendency towards industry-oriented research has originated in our universities, that is a very promising indication. I should confess that I could not go into the cause of this tendency deeply but, it exists. Feeling this tendency of the research sector, the Industrial Liaison Unit of the Council doubled its efforts to stimulate a demand for research in the industry sector and a planned visiting programme has been envisaged for trouble shooting, by making unannounced visits to the industry on a sectoral and regional basis, trying to establish an organic link between industry and research. We hope as this organic link is strengthened, the demand for information from universities will increase in the near future.

As I speak about the research sector I would like to say a few words about university libraries. To my mind these libraries should gain a more dynamic character and should turn into information centres rather than being static book shelves patiently waiting for the magic touch of the users. University libraries should have an active and even aggressive character to attract users and should develop into information units stationed in the national and international information network.

b. STATE OWNED RESEARCH UNITS AND TURDOK

In Turkey, state owned research establishments are concentrated mainly in the Ministry of Agriculture. The R and D survey of 1964 showed that all of the research manpower and expenditure of the country belonged to the Public Sector and Higher Education Sector; 86 % of the total research expenditure was made by the public sector. Three-quarters of it went to agricultural research and related activities like mineral surveys and energy surveys.

1. AGRICULTURAL SECTOR AND TURDOK

Personal contacts with the agricultural sector immediately resulted in an increase in the number of enquiries, the demand could easily be met by TURDOK with

its manpower and library facilities. The reason of this well-settled demand and supply can be explained as follows: although the Ministry of Agriculture has its research centres spread over the country, the lack of library facilities or any information units within the majority of the centres leads them to consider TURDOK as a life-saver.

State-owned research centres or units are established in order to solve the problems of the user (i.e. farmers, producers, cooperatives etc.) and the characteristics of the problems enforce the researcher to the functional research, hence, the need for information and documentation services is prominent.

Research scientists of this research sector are not academicians but practical-minded technicians facing the actual problems of their region and they would welcome an information service supplying them with data when they conduct or plan to conduct applied research or an adaptation and development activity.

2. INDUSTRIAL SECTOR AND TURDOK

The outlook of the industrial sector and its need for information can neither be identified with the university sector nor the agricultural sector. This sector comprises:

- State enterprises, private sector and cooperatives;
- Large industries, medium and small-scale industries;
- Industries set up by imported technologies, or industries considering performing adaptation and development activities on available technologies or even to produce their own technologies;
- Capital-intensive (technology-intensive) industries and labour-intensive industries;
- Science-based industries;
- Industries to be set up in a planned period.

As you will see this colourful mosaic image of industrial activities in Turkey would of course call for various types of information to respond to the enquiries and the most appropriate means for transferring the information should be sought. Services provided by information and documentation centres should include the identification of specific information needs, the acquisition of the relevant information and the tailoring of it for direct application by industry. The demand stimulating activities of TURDOK in the industry-sector started four years ago. It was observed that Turkish industry is starving for information and there was no need to revisit the industries in order to keep close contact.

The enquiries from the industrial sector outnumbered the enquiries of the academic sector in a few months starting soon after the visits. We faced the following problems which we had not encountered during our previous years' contacts with our clients, comprising mainly the academic sector. The problems were:

1) The types of information are not limited to production but cover all aspects of industry (management, suppliers of equipment, markets and marketing etc.);

2) Industry asks for readily-digestable information rather than synthesizing the pieces of knowledge scattered in various forms (abstracts, articles etc.);

3) Language problem is the main difficulty when small-scale industries are concerned. The information provided for them should be vulgarized and be comprehensible in their own expressions avoiding scientific jargon.

In order to meet the information needs of the industry, TURDOK felt the necessity to reorganize its activities and new methodologies were adopted. I should confess that a more dynamic and realistic information activity has started due to the pressing demands of the Turkish industry.

As I mentioned above, the Scientific and Technical Research Council and its research establishments (Marmara Scientific and Industrial Research Institute, Building Research Institute and Supported Research Units) are the sole research organizations that deal with the technical problems of Turkish industry. The Council tries to solve the problems of Industry by various means according to the complexity of the problem:

a) Advice on the spot

b) Consultancy

c) Literature surveys + research scientist

d) Short-term development or adaptation activities

e) Long-term research projects

f) Long-term multidisciplinary research projects.

As you will understand every category of problem-solving means calls for documentation services.

Apart from that, the non-technological information need of the industry forced TURDOK to become an active information centre giving a service in socio-economic fields as well as science and technology.

INFORMATION USE HABIT OF

UNIVERSITIES:

It has been observed that the university staff prefer the secondary facilities provided by the Information Centre, such as photocopy procurement, translation service, etc. It is understandable because especially the recently-established universities are usually equipped with well-organized modern libraries and the academic staff are usually acquainted with the information sources in their field of speciality such as abstracting and indexing journals and primary publications, reference books, etc. In the traditional universities the conditions are not so favourable as far as the way of action of the staff and library facilities are concerned.

INDUSTRY.

On the other hand, the industry sector showed itself to be an eager user of information services provided by the Centre. The type of information requested as regards the content and the form forced the Centre to revise its services in order to meet the information need of the industry sector to its best possible extent. The confidential character of the enquiries, required rapidity, easy-to-digest type of rendered services are the basic characteristics of the industry-oriented information services. The major factor that plays an important part in the efficiency of the services, is a good definition of the firm's information absorbance level and penetrating skill of the information offices to the problem. Visits and personal contacts seem an indispensable way of approach to the industry sector in order to gain their confidence in the information services and to maintain the demand level on an increasing scale.

It has been observed that a certain amount of user training occurs automatically through the visits paid by the information officer. Behavioral characteristics of the information officer play an important part in the efficiency of the services.

ADMINISTRATORS, MANAGERS, DECISION-MAKERS:

This category of user is willing to benefit from the information services. The character of the service expected is usually one or two sheets of digests or a series of numerical data or statistics. They are after the kind of information which might help them to have a broad view of their problem covering economical, sociological and political as well as technical aspects. Therefore this falls beyond the capacity of the national information services and necessitates the establishment of in-house information units within the enterprise, institution, etc. A national information centre service should be evaluated, scanned and digested by the in-house

unit to be presented to the manager, administrator or the decision-maker. A remedy would be to convince them to set up their information units and the way of approach is: to organize seminars, conferences and panel meetings in order to brainwash the managers with regard to the importance of information as an infrastructural necessity for decision-making and give an idea as to the organization, functions and responsibilities of the in-house information units versus the management.

CONCLUSION.

I have tried to give you an overall picture of the user categories, their needs, their information-using habits, and also the measures taken for efficiency.

I would like to summarize the measures to be taken in short and long range for different user sectors as they are planned, based on our experience:

RESEARCH SECTOR.

Long range:

1. Information use habit should be established at least at the university education stage and necessary revisions should be made in university curricula.

2. The next generation is liable to use information extensively in its various activities. Therefore whether users take part in the universities as academic staff or in the business world they will be conscious of the value of information and seek it. Therefore it should be government policy to integrate information science in the university curriculum.

Short range:

To create an information-conscious user through mass communication and local, regional or inter-regional meetings.

INDUSTRY:

Training of information officers that give service to industry has priority over the training of users. It is through the personal communication of the information officer with the staff of an enterprise, administrator or decision-maker that autotraining of the user will be realized. Information-seeking habits will be established if a good service is received and the idea of setting up an in-house information unit will follow.

In my opinion, the best training of the user in the industrial sector could be achieved by the interaction of a clever information officer with the user and I cannot imagine any type of training that could substitute the person-to-person communication and a good service.

USER TRAINING IN THE CONTEXT OF A TECHNICAL INFORMATION SERVICE

By

G.P. Sweeney
Institute for Industrial Research and Standards

Who are the users:

It is necessary to begin with some definition and delineation of the field of which I am to speak and which is described as "technical information". A technical information service is an operational unit which communicates information in documentary, oral or visual form to an industrial client as an input to a decision situation or for incorporation into a process, product or operational activity.

The information communicated can be technical, scientific - or commercial, economic or otherwise - or any complex fusion of these. The significant factor is specific relevance of the information to the situation and needs of the client as these exist at the moment of supply. The client may be a scientist, engineer, technologist, technician, manager or operator. The situation and needs are as they exist at the moment even though they may be concerned entirely about what will happen in the future. Furthermore, they are unique.

The user himself exists in the unique environment of his company, its structure and his role in that company. The company itself is unique in its location in its industry, technology, market and geographical position. These and other factors make up the uniqueness of the total environment. Furthermore, unlike that of the academic scientist the environment of the industrial user is not one which has communication of information as an objective. The academic scientist has the objective of not merely generating new information through his research but also of communicating this information to his peers through correspondence, discussion, papers read and published. This communication system is equally the system through which he obtains his information. Primary and secondary journals (or their current equivalent) seminars, conferences, sabbaticals and so on provide the mechanisms through which he obtains the information which he further processes to provide a new input into the system.

It is possible to speak of scientific information services in that these are services devoted to scientific information for use by scientists. The scientist through his education and development in his discipline is trained in the use of the system.

The user in industry, even although he may be a scientist, is not in the normal course of his work operating within such a communication system providing him with what he requires. His objective is to apply science and technology within a constant changing framework of economic, commercial and social information to products, processes, systems and marketing, in order to create economic wealth. He is not trained to acquire such information because his requirement is not a continuous one. Each new situation is novel and unique in itself, to the extent that previously acquired knowledge and experience can provide only part of the input.

Recognition of the need:

As a consequence, the user in industry spends a lot of his time in searching for, assembling, evaluating and communicating information. Such evidence as is available demonstrates that in practice the industrial user spends more time in these activities (all embraced under the heading of communicating) than does the academic scientist. 60 to 70 % of his total time may be spent thus. Surveys have shown that search and acquisition alone absorb 15/30 % of available time. In Canada, engineers and technologists spent 15/20 % of their time thus, in the United States industrial chemists spent more - 16 hours a week, and in Britain design draughtsmen spend 20 % of their time in the search activity.

The fact that such a large amount of resources are spent on acquiring and processing information demonstrates a recognition however ill-defined of the need for information. The resources may, however, be and often are misapplied because of ignorance and of isolation.

The success of industrial activity is measured by the wealth created but is dependent on the success of the search for information and on its evaluation. Successfully innovating firms have been demonstrated to have strong links with specifically relevant sources of information and to have active programmes for acquiring and processing knowledge and information.

Economic role of information.

The main factor in economic growth is the commercially successful application of science and technology to products, processes and systems. It consists of innovation such as an application of science and technology in a new or novel way. It also consists of the adoption of the best technical practices. This latter is the more important factor in growth, and essentially it is an information problem. As an information problem it embraces the identification both of the technology or technique and of the source, and the communication and evaluation of the information and data on the technology or technique.

Application of the information results then in a product (including system) competitive with those already available on the market.

Factors in the use of sources of information:

The sources of information are many, and the degree to which any are used depends on a range of factors, none of which are mutually exclusive:-

The level of technology of the industry in which the firm operates;
The size of the firm,
(both of the above are related to the number of trained engineers and scientists employed by the firm),
Geographical location i.e. distance from centres of expertise and information in the relevant technologies;
Active recognition by the firm of the need,
The ease of access of the source and the level of personalisation.

The sources used:

Experience and knowledge of firm's personnel;
Suppliers of materials and equipment;
Newspaper, trade and technical magazines, scientific journals;
Exhibitions;
Training programmes, courses, conferences;
Libraries;
Associated companies including those with whom licensing agreements are in force;
Information services,
Research centres, institutes and universities;
Internal management information systems.

A survey carried out in Ireland in 1971 demonstrated the interrelationship of some of the above factors and the level of frequency of use of some of the sources. The results are supported by other surveys of the use of specific sources or of dependence of certain factors. (See Table I)

Suppliers had a comparatively high rating throughout the different groupings of firms. Variation in levels of use of all sources stemmed from size, more especially from the level of recognition of the need (R & D activity, management/personnel spending most of its time searching for information) and from the level of personalization of the source. A further factor not illustrated in this table showed that level of use varied according to the industrial sector, a factor related to the level of formal training of personnel.

Table 2 shows the effect of R & D performance and size on information acquisition. R & D here should be interpreted as a conscious attempt to bring in some form of technical improvement, e.g. quality control laboratory. The isolation of small firms not having such a characteristic from information sources is clearly seen and thus illustrates the "small firm problem".

Behavioural psychology:

The heavy use of suppliers is probably a part of the most significant phenomenon of the pattern of behaviour followed in obtaining information.

For the most part, people prefer to talk to someone with whom they are personally acquainted. This is particularly the case in the phases of defining the problem, in developing ideas and in searching for solutions. Very often the solution is also obtained in this way. The person used as an information source is someone easy of access, that is little or no effort is required to make the contact, and such a person is used regardless of the known quality of the information available from him. The suppliers representative is personally known to the manager or other personnel of a firm, he makes himself easy of access by himself making contact on a regular basis, he is used as a source for a variety of information topics, regardless of the quality of the information he supplies.

The opposite end of the scale has been demonstrated by some innovation studies. The successful innovator not merely uses actively most information sources, but has direct personal links to the people most expert in the specific technology concerned in the particular problem area of the moment.

The firm as a learning system:

From the above, it can be seen that the firm at its most successful level of operation is a learning system. As a learning system it is constantly examining its state of knowledge, searching for new information, evaluating the information as to whether it presents a problem or provides a solution to a problem, thus adding to its state of knowledge. Other firms are not actively operating as learning systems, due to ignorance and isolation.

The Technical Information Service:

Some firms establish their own in-house information services. These by general practice are restricted to documentary-type services, providing information or access to information in documentary or near-documentary form, or providing through bibliographical tools, reference to non-bibliographical sources. They are also often confined within the structure of the firm to a specific sector such as the research department. The role of such service units as they might be enhanced is not a topic to be developed here, but the principles enumerated are equally (though differently) applicable.

A technical information service supported by national and/or industrial funding and serving the whole or some sector of industry is established to make users aware of the sources of high quality information of specific relevance, to establish contact between source and user, and itself often to act as a source, in other words, its priority objective is to develop a communication network within which each individual is in effect a nodal point.

The factors to be taken into account are:

- the constantly changing unique character of the user need;
- the variety of sources of information;
- the restricted role of previously acquired knowledge,
- the preferred personal channel of communication.

Context of a training programme.

Training of the user involves training him to communicate, to maintain himself within a communication network. The techniques and mechanisms used must be both formal and informal.

This development of the network is the first step and is accomplished through development of the preferred channel of communication by means of an industrial extension service. The objectives of this are to:

establish continuing personal contact with industrialists, gain credibility and win confidence through ease of access ability to listen and communicate;

identify and define response to specific problems or opportunities for improvement or development within the company i.e. opportunity for adoption of a better technical practice, in order to improve overall performance of the enterprise;

bring user into contact with sources of information, specifically expert in the problem area and ensure his effective use of these.

Media used:

1. Personal visit and communication by the Extension Officer,

2. Periodical publications;

   Regularly published magazines, bulletins, newsletters;

   Readership group should be clearly defined.

The contents can be:

a. Articles containing immediately applicable information on topics known to be of concern to a section of the readership.

b. Abstracts (whether presented in formal or informal fashion).

c. New publications etc. and news, activities, diary of the industry.

Overall objective is to maintain the contact of the Technical Information Service between personal visits; then to present authors of articles and their organizations as expertise available; and to create awareness of a wider range of information and of its availability through library and information services.

3. Public Media.

Newspapers, radio, television.

Stories, news items, features advertisements.

Diffuse readership restricts objective to maintenance of contact between the service and the user. As transfer mechanisms they are of limited value.

4. Courses,

Presentations by experts in specific areas of technology or management techniques to groups of industrialists identified as having a defined need for the particular discreet package of technology. Content should be such as to give sufficient knowledge and information to enable evaluation or assessment and decision-making to be undertaken. They are not operator training. Further objectives are to develop the personal communication links - between user and expert, between users and between users, experts and the Extension Officers.

5. Courses in information handling.

Such courses should follow above 4, but also include both operator training and user training.

Management, as above 4; to develop enquiry and acquisition processes, evaluation and assessment; internal structures for these processes, management of total information/knowledge input.

Operator; to train staff in specific sections of total information process, i.e. in traditional information/documentation areas.

User; to train users in those techniques which they will implement themselves e.g. personal file handling, use of on-line systems.

6. Study Groups.

Visits by defined group to research institutes, supplier companies, exhibitions, to discuss specifically relevant activities, expertise and facilities. The objective is to awaken to best available techniques and to establish contact with the sources of these.

The programme is a continuing one, constantly re-defining needs and identifying new ones, so that reaction to those needs can be realistic and accurately focussed. The uniqueness of the user's environment and situation become then an aid to progress rather than a barrier.

TABLE 1 COMPARISON OF FIVE GROUPS OF INFORMATION USER

	Criterion	Average General (%)	Average for firms not employing an Info. Person and not doing R & D (%)	Average for all firms doing R & D (%)	Average for firms employing an Info. Person	Average for firms doing R & D and employing an Info. Person
Journals	Over 5	23.0	13.4	40.5	48.5	52.2
Conferences	3 and over	41.5	31.1	59.9	70.0	71.7
IRELAND						
Supplier/Customer	Freq.and occ.	69.8	68.5	74.9	73.0	76.3
Sci./Tech. Library	Freq.and occ.	25.9	16.4	41.1	51.5	58.5
Res./Trade Org.	Freq.and occ.	42.4	37.2	53.3	58.5	63.7
Tech.Inf./Advry.	Freq.and occ.	37.8	31.8	49.2	53.5	57.8
Associate Co.	Freq.and occ.	20.8	16.8	28.5	30.5	34.8
ABROAD						
Supplier/Customer	Freq.and occ.	51.3	43.4	67.2	62.5	69.4
Sci./Tech. Library	Freq.and occ.	15.8	8.0	28.9	34.5	39.5
Res./Trade Org.	Freq.and occ.	25.8	17.7	39.0	45.0	46.2
Tech.Inf./Advry.	Freq.and occ.	24.7	18.4	35.6	42.0	47.0
Associate Co.	Freq.and occ.	22.8	18.0	31.9	30.5	31.3
Inf. Person	Employing	9.0	-	19.0	100.0	-
Difficulty in getting inf.	Extremely and fairly	28.9	26.5	34.6	36.5	39.8
Difficulty in keeping up-to-date	Extremely and fairly	34.0	32.5	38.3	38.0	43.4
Expenditure	Over £100	23.1	11.5	43.8	59.0	63.0

TABLE 2 BUSINESS ENTERPRISE SECTOR - CHARACTERISTICS OF FIRMS CARRYING OUT R & D

1 9 7 0

(N = 728)

	Criterion	General Average	Average for all R & D firms	Average within a particular size category (Less than 25) R & D	(Less than 25) Non R & D	(25 - 100) R & D	(25 - 100) Non R & D	(Over 100) R & D	(Over 100) Non R & D
Journals	Over 5	23	40.5	22.6	5.5	30.5	15.0	69.1	41.5
Conferences	3 and over	41.5	59.9	42.8	21.4	56.2	36.0	82.4	58.6
IRELAND									
Supplier/Customer	Freq.and occ.	69.8	74.9	71.2	63.2	74.9	69.9	78.8	71.9
Sci./Tech. Library	Freq.and occ.	25.9	41.1	39.0	16.0	37.4	17.3	51.0	19.5
Res./Trade Org.	Freq.and occ.	42.4	53.3	47.0	27.6	51.6	42.6	61.3	51.8
Tech.Inf./Advry.	Freq.and occ.	37.8	49.2	46.2	26.2	47.7	35.2	54.8	41.8
Associate Co.	Freq.and occ.	20.8	28.5	20.7	11.1	31.4	18.9	32.9	28.0
ABROAD									
Supplier/Customer	Freq.and occ.	51.3	67.2	57.3	33.7	67.5	46.7	78.9	59.6
Sci./Tech. Library	Freq.and occ.	15.8	28.9	20.3	7.3	27.3	7.9	39.3	14.9
Res./Trade Org.	Freq.and occ.	25.8	39.0	28.8	11.9	33.8	19.9	54.4	33.9
Tech.Inf./Advry.	Freq.and occ.	24.7	35.6	30.9	14.3	32.6	22.0	43.7	26.1
Associate Co.	Freq.and occ.	22.8	31.9	18.2	6.6	34.2	22.6	43.3	41.2
Inf. Person	% employing	9.0	19.0	18.2	2.6	16.8	4.5	22.5	7.0
Difficulty in getting inf.	Extremely and fairly	28.9	34.6	37.2	26.3	33.9	24.0	32.7	27.0
Difficulty in keeping up-to-date	Extremely and fairly	34.0	38.3	42.0	33.5	38.6	29.2	34.8	29.3
Expenditure	Over £100	23.1	43.8	23.0	5.0	42.0	12.5	67.6	39.7
Total No. of firms		2270	728	247	726	238	501	235	214

SC-74

SENSITIZATION OF DECISION MAKERS, POLICY MAKERS AND MANAGERS

by

M.J. Menou
Information science consultant

Although the title our topic has been given in the agenda (point III) of this seminar is somewhat limitative, it seems that it might be useful to start with some points of clarification regarding the training of managers in the broader field of information users education and training.

As a matter of fact, almost everything, or every basic concept, related to information work needs clarification if information science is to become a true scientific discipline. Obviously the word information and most derived terms is the first cause of ambiguity. Users, managers, education and training of users are no better words.

1 The information system is a facet of society as a whole.

If we accept some degree of oversimplification, we may say that the conceptual field of information is under the influence of two poles, or major representations, of information systems.

In the first one, which is the most ancient and common, information systems are considered, so to speak, from the interior. Any information institution, or even a piece of it, like its information storage and retrieval sub-system, tends to be seen as the information system as a whole, the environment occupying only a small and subordinate place. In the second one, the focus is on the flow and use of information throughout society. Information institutions are only limited modules of the information system, i.e. some functions are transferred to them as a result of the general trend towards specialization and division of labour, but the environment is predominant. (This is in fact the view of many users who see the information institutions as limited off-line resources in their own information system.) Such a total approach was presented for instance by A. Merta (I) and more recently by V. Slamecka and co-workers (2); we tried from the very beginning to keep with this comprehensive conception (3).

2 The so-called users are a component inside of the system and have multiple roles.

Studies related to users provide a good example of the limitations of the first approach. Users are defined there as the persons taking actually benefit of the services of a given information institution. It means that they are only considered at its output side. Moreover, most of the socio-professional group concerned by that particular service remains in the category of potential users to which one tries only to demonstrate the value of the service and the interest it might have to use it.

According to the second approach, we consider that the human element in the global information system consists of information specialists and non-specialists. The role of the non-specialists within the system is complex and multiform, as they:

- generate information items
- produce recorded (primary) information
- operate as information sub-systems, or part of them (at the individual and/or inter-individual level), and interact with information institutions in the sharing of the functions of information transfer
- support information institutions
- use information institutions
- evaluate and use information

Any educational and training effort dealing with only one of these types of involvement can only have limited effects, which may be appropriate if the objectives are also limited to some particular transaction (e.g. the use of some information products), but will not result in any improvement of the global information system and consequently in real or measurable benefits for the society. On the other hand, the pedagogic effectiveness is likely to be hindered by such an artificial distinction as the users see information institutions, the information system and their information satisfaction through the whole set of roles.

3 Information needs are better identified by the type of action for which information is needed.

Not only the concept of "user" is a non-satisfactory generalization, but the way in which categories of users are traditionally distinguished is also unoperative. Either they are the clients of a given information institution or, when the public at large is considered, it is divided into broad socio-demographic groups (pupils, students, active population further divided into scientists, engineers, managers, etc.). Although these groups may be characterized by common features related to information needs and use (i.e. their background in relation to them), types of activity are far more important in order to define information needs

and use, as we once advocated (4). Any individual of whatever socio-economic status is engaged each day in various types of actions, e.g. gathering facts, preparing future actions, making decisions, participating in the production of goods or services, communicating, reporting, leading or controlling other people, taking part in administrative procedures, solving material problems, etc., which require different types of information and involve different patterns of information gathering and use (5).

Thus the main criterion should be "information to do what" instead of "information for whom".

Moreover, the type of activity can only be defined with the help of two other parameters:

- the objects (structures, actions, people, material goods, services, information items, etc.) dealt with, and

- the level at which the activity is performed, ranging from the individual itself to several organizations on the international scene.

4 The preparation of non-specialists encompasses a wide range of objectives.

Likewise, "education and training of users" is a rough generalization which does not allow for any analysis nor operation. The preparation of non-specialists for a better contribution to information flow may be classified according to seven groups, corresponding to an increasing specificity of the preparation:

1. Promotion: general propaganda facilitating the development and improvement of information activities;

2. Sensitization: give an overall view of information systems, or of a general model of the information system paving the way for further improvement of the information situation and training;

3. General introduction: give a basic knowledge of information system(s) emphasizing the need for their creation or development and/or use;

4. General training: give a basic practical knowledge of the main information tools or processes;

5. Special introduction: give a general view of a particular information system;

6. Special training: let the trainee know how to interact with a particular information system;

7. Elementary training: let the trainee know how to participate in a particular process within a given information system.

5 The group of persons identified as "managers, decision makers and policy makers" is a diverse and complex one.

The group tentatively identified in the title by the words "decision makers, policy makers and managers" is a complex one. It may encompass:

- the persons who are the supreme heads in each enterprise or government agency (President, director-general, minister, etc.),

- the few persons between whom the supreme responsibility is divided within an organization (top management),

- all persons occupying any highly responsible position (senior staff).

This wording infers that, in any society, there is a group of people whose activity is mainly or exclusively decision making, policy making or managing. Although this is true in the upper levels of complexity in societal organization, there are many instances where such responsibilities are only one aspect of the individual's total activity. There is also a great disparity in the background of such people and the scale at which they operate; the president of Lockheed Corporation and the manager of a small furniture plant have rather different resources and concerns.

6 Their preparation could consider either their own direct role in information transfer or their indirect role in facilitating it within their organizations.

Nevertheless, this group has been currently considered as a very important, if not priority, target in most programmes and studies on "user training" (6). There are two good reasons for that. First, its activity commands to a large extent the activity of other people and it is important that it is as effective as possible, which requires, if one accepts the axiom according to which effectiveness is directly proportional to a proper use of information, that it is well prepared for information work. Secondly, it is to a large extent responsible for establishing the framework in which other people will have to work, that is to say, inter alia, facilitating or hindering the operations of information systems.

Although these two areas are likely to have close links, it seems better to separate them when devising "user education and training" for this group.

7 Actions directed towards the direct role.

As far as the first area is concerned, which we may call "direct concern", the purpose of training and education on information does not differ from those of other groups. It may encompass the seven types of action mentioned earlier. There is, however, a problem regarding the definition of the size of the group and its functions.

One may either consider the upper part of the human resources within a society, a branch of activity or an organization and deal with all its activities (or reduce them to the practice of authority), or one may consider the various subjects and circumstances which require decision making, policy making and management (e.g. medium-term planning in small enterprises, marketing strategies, etc.).

In the first case the audience will be exposed to actions from type 1 to 4, in the second case, 5 to 7.

Normally, education and training on information at this level should be part of the overall professional preparation. However, not all persons occupying responsible positions go to business schools or programmes. Many have another background in which leadership, organization and communication occupy little or no place. Even in business schools or schools of public administration, these questions are handled in very diverse ways, often a very formal, limited and authoritarian one (7).

If one tries to train already active people, one is faced by many difficulties. The most obvious one is the limited accessibility of such persons. Another one is their requirement for practical results, which suppose that those in charge of the programme know and make use of real facts and situations, while they are either "secret" or too sensitive. The third one is the reluctance of potential participants to get involved in a pedagogic process with some of their pairs and tell the true stories. Games and simulation may help alleviate these obstacles. But they are only the emerged part of a more considerable iceberg. The behaviour in information matters is only one aspect of the total managerial practice and structure. The association of information and power is, even unconsciously, much more sensible for those exercising the power.

This is the main reason for which we do not think that a special training on information (5 to 7, and even 4) is worth attempting but under particularly favourable circumstances. Here again, information should be incorporated into training programmes on other topics, what supposes that the tutors either are well aware themselves of information work or have good and close connections with information specialists.

At this point, it should be noted that courses on management information systems, although overlapping to a large extent with our topic, do not fully nor properly cover it, because of their technical and "internal" nature.

We must confess that our information about such attempts is all but exhaustive. However, subject to later check, if we heard often about projects to organize courses on information for managers, we never heard about actual or successful implementation.

8 Actions directed towards the indirect role.

Coming to the second concern, the facilitation of the establishment and/or operation of information systems, we are faced by the same problems.

Actions of the type 1 to 3 could be envisaged at the university level but no distinction could normally be made between future leaders and the rest of the students. The programmes could not thus far be differentiated and are likely to tackle with this point as an extension of the overall preparation on information work. However, the few specific programmes of this kind do not seem to consider such large scale aspects, nor does the discussion of information and communication within other subjects, when it occurs.

Nevertheless, in some developing countries the great majority of students has a good chance to get leading positions and should be trained accordingly. The same happen in some other countries, like France, for a few "select" schools.

Actions directed towards active managers are more common. As one deals then with actual situations, two basic cases may occur:

a) the information infrastructure has reached a stage of development at which its effectiveness and reliability could be demonstrated, or

b) the information infrastructure is too deficient or embryonic for demonstration.

8.1 Objectives and approaches when a suitable information infrastructure exists.

In the first case, the target group may include all persons having the authority to arrange for structures, procedures and duties of staff. The objectives may be to foster their willingness to:

a) change their values and their behaviour versus information and contribute to the same change among their staff;

b) change the internal structure and mode of operation of their organization in order to improve information flow and use;

c) allot means (finance, skilled staff, etc.) for achieving a) and b);

d) further train themselves and have their staff trained on information work;

e) urge for changes of information structures and procedures outside their organization (branch of activity, local, national and international level).

For this purpose they have to become conscious of the importance and complexity of the information problem, correctly appreciate the challenging factors and the conditions for response, be prepared to take appropriate courses of action (analysis of their organization, human and material investments, organizational decisions, etc.).

With various emphasis on these objectives and some supplementary ones, several attempts have been reported in this area (personal contacts by extension services or other information institutions, conferences lasting from one to a few days sponsored by various kinds of organizations, seminars lasting about a week, like the regional seminars on industrial information sponsored by UNIDO (8) and the seminars on the use of documentation and information for planning and decision making sponsored in East Africa by the German foundation for international development with Unesco assistance (9).

In most instances these actions have been punctual and it is therefore difficult to assess their effectiveness and draw conclusions and guidelines from them. The problems mentioned about the so-called "direct concern" are encountered as well here.

8.2 Objectives and approaches in the absence of a suitable information infrastructure.

In the second situation, one may also have the above-mentioned objectives in mind but they are superseded by the need for obtaining adequate support in order to improve existing information infrastructures or setting up new ones, this being one aspect, or one consequence of the information consciousness of the society as a whole.

In other words, the effort will only occur if there is a commitment to change or improve the functioning of the society. Although harmonious development is a widespread leitmotif not all leaders are really

prepared to reconsider the goals, the equilibrium and the operations of the society, nor their own position within it; they will certainly not do so without strong pressures from most parts of the society. At any scale the ruling class has its own information sub-system and is satisfied with it, unless a dramatic error occurs, because it is exclusive and, so to say, cosubstantial to it. From this point of view, it is symptomatic that even in information sensitive branches of activity the formal information systems are under permanent danger of being the first victims of any budgetary reduction.

There is a basic contradiction: we need the rulers in order to change the rules which, consciously or not, they do not see as limited technical improvements and which in fact open new avenues in the sharing of power.

It might be possible to use the technocratic ideology in order to present a more limited and acceptable case for information. However, we do not know which arguments and which modes of communication may be effective for our purpose. In most cases "user training" is carried by information specialists and sounds very much like advocating pro domo, with emphasis on internal technical operations which are of no interest for the "users" only concerned with the product and its practical value. There is also some evidence that any demonstration is better accepted when it comes from peers or superiors.

For this case, like the previous one, the access to the right public makes also problems. In many countries, nothing will happen without an impetus coming from the highest level. That is to say that one has to convince chiefs of state and ministers. When it is a matter of implementation lower levels in the hierarchy are to be approached, but they have to be committed by superiors orders to take part in such activities not only to spend more or less comfortably some time out of the office but to prepare actions.

Almost all components of these activities are subject to fundamental questions:

- Who should be approached? Can a strategy be devised according to the position or influence of persons or according to their areas of responsibility?

- What kind of message is to be delivered and through which channel?

- How should the message be passed?

- Which are the most appropriate circumstances (or schedules) for communicating the message?

- Who should take the initiative? Are foreign interventions, even allied with local sponsors, more easily accepted or rejected?

- How to measure the effectiveness of such actions?

9 Areas for study and action.

We would like to conclude with some practical proposals. All we tried when focusing on the many difficulties in "user training" was to help information specialists to abandon the schoolboy attitude which is far too common in this matter but certainly not call for renunciation. On the contrary, the sensitization of managers, policy makers and decision makers, and their further support for information activities should be permanent and systematic activities.

To do so, one needs to get better insight into:

- the educational background and values of these persons in relation to information;

- the methods and arguments successfully used in order to sell them ideas or train them on any subject;

- the alternative strategies which could be implemented (for instance, the conditions, in a given situation, for the always advocated and rarely demonstrated "multiplier effect" to really work).

A standing and long-term programme (as the punctual nature of past activities is a major cause of failure in our opinion) should be elaborated, including:

a) continuous and diversified promotion efforts. These could be better achieved by personal contacts, by demonstration of effective services or operations in matters of concern for the leaders and by rendering some limited but valuable services (10); for instance, a personal regular information note for the Minister may prove more effective, in first instance, for the survival of a centre than the number of documents processed;

b) getting the support of opinion leaders and educators, including management consultants, and preparing them in order to convey the message;

c) educating future leaders, i.e. actual students, not only at the level of their professional skills and needs but also at the level of their values and social attitudes;

d) organizing standing sensitization programmes with a follow-up, based on concrete and attainable objectives and integrated with other programmes for the training of specialists and non-specialists at the various levels and for the development of information institutions;

e) sensitizing not only top people but all the population as the changes are more likely to occur as a result of a widespread social concern.

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MEANS AND METHODS OF TRAINING USERS

by

A. J. Evans
Loughborough University of Technology

'There is not a single approach and content appropriate for all groups. On the contrary, each occasion deserves separate consideration. The local circumstances can influence both the approach and the content. Factors such as jobs or fields of study, inter-library co-operation, group size, environment, related work and demands on time need to be taken into consideration. Many of these factors can be anticipated and incorporated into the planning. Sometimes unexpected events necessitate discarding planned material and substituting more appropriate material during the actual presentation.'

This quote from the UNISIST Guide really sums up the situation in general terms although there are of course certain basic aspects that are soon established. Having determined that a course is required, the nature of the participating group will soon become clear and in itself, to a certain extent at least, dictate the timing and duration of the course as a whole. Whatever type or length of course or whatever the mix of participants that evolves, the emphasis must clearly be more on training in information retrieval and other related skills and not on the bibliographic approach, or what has been referred to elsewhere as the mini-librarianship approach. The balance between these two extremes should both improve the ability of the participants to use existing information resources already known to them, and also make them aware of other information resources and services available to them, either in their own library/documentation centre, or indeed, elsewhere. It is the lack of awareness, unfortunately existent in many students and indeed, practitioners, in science and technology, that has to be overcome as far as possible. Such awareness does not mean that they can always find answers directly themselves, but that they can at least ask the right questions in their search for knowledge, even if through a librarian or information officer.

In an institution of higher education for example, courses may vary in length from three one hour sessions to a series of twenty or thirty hours, spread over several terms or semesters. Whilst introductory lectures may be given, within reason, at any time during a course, it is preferable that the more intensive part of the course should be given just prior to a time of extended need, such as project work. At all stages it is essential that close collaboration takes place with the teaching staff in the relevant department. The one particular advantage of teaching this particular type of group is that they will be of the same educational level and in all

probability, concerned with one particular subject area. However, this is not usually the case with a group of practising engineers and scientists, although of course preferable. The probability is that they will be of a mixed subject orientation and indeed with different job structures - for example, research, production or planning. A course for such a group also has such possible disadvantages as having to be given by 'outside' lecturers in a strange environment. They do however have the advantage that they will generally be of short duration and concentrated - possibly between one and three days. An example of a three day workshop is given as Appendix 1.

In running such a course it is of paramount importance that the location is suitable and it has been found useful to send a brief aide-memoire to the host institution (Appendix 2), outlining various requirements. This is particularly necessary in view of the essential practical elements of all types of course. These practical exercises should aim to illustrate the range of resources available to a user. It is also usually necessary to emphasize to participants that in such practical exercises, the 'right' answer is of course extremely welcome, but the methodology of information retrieval in its basic sense is far more important. Such methodology as may be given in the lectures may of course have to be adjusted - often severely in some cases - to meet the existing facilities within the library/documentation centre of the host institution. The principal requirement is that a 'subject' approach to the collection is possible and not merely a purely bibliographical one. It is of course possible for the host institution to produce lists of encyclopaedias, handbooks, abstract journals, etc. to meet otherwise unavailable search routes, but this tends to give the participants a rather rigid outlook which is unlikely to be repeated in the next information centre he visits!

Arguments about the value (or otherwise) of handouts and lists will no doubt continue, but in general it can definitely be said that not only are they very soon out of date, but they are almost invariably in the wrong place at the wrong time.

There is now a fairly extensive bibliography on 'user education' but little if any, on the structure of actual suggested courses. In the UNISIST Guide we have attempted to establish a framework around which any course could be built to meet a variety of needs, and emphasizing where necessary, modifications which may be applied to meet differences in such areas as the subject background of the participants, their educational level, and the location of the course. There are of course available, a plethora of books of such titles as 'Information sources in ...', or 'How to find out about ...', in many languages and also of variable quality. One of the more recent of exceptionally high standard is that by Parker and Turley, entitled 'Information sources in science and technology', published in 1975 by Butterworths, London. Such an authoritative book as this may be used by an erstwhile course instructor as a basis for his lectures quite extensively. Many

institutions (for example Chalmers Institute of Technology in Gothenburg) have produced their own internal publications in this field which although invaluable in their own country, have of course severe language restrictions.

To return to my original point about flexibility, this has not only been found to be true in our own University at Loughborough, but also confirmed very clearly in the field trials of the Guide in India and Korea. Thus while it is by no means impossible for 'outside' lecturers to run courses in another institution, the aim must be to train internal people for such tasks wherever possible. Hence although it is hoped that scientists and technologists in general may find parts of the Guide - particularly the early sections of chapters 5, 6 and 7 - useful directly to themselves, the aim is predominantly to provide a Guide for the ultimate teachers of user education.

APPENDIX 1

Example of a 3-day workshop

DAY 1	**INTRODUCTION**
9.30 - 10.30	Introduction to information retrieval - value of information - sources of information - using libraries/documentation centres to find information - finding tools
10.30 - 11.30	Preliminary discussion to establish needs of participants
11.30 - 12.00	Coffee break
12.00 - 1.00	Visit to the various sections of the host institution (i.e. library/ documentation centre)
1.00 - 2.30	Lunch break
2.30 - 3.30	Practical work - quick reference questions
3.30 - 4.00	Coffee break
4.00 - 5.00	Discussion on practical sessions
DAY 2	**BASIC SEARCH TECHNIQUES**
9.30 - 11.00	State-of-the-art literature search - needs - search strategy - evaluation and sup,lementation - case study - common problems (e.g. headings, alphabetical order, accuracy and reliability) - data and factual information
11.00 - 11.30	Coffee break
11.30 - 1.00	Practical work 2 - project information
1.00 - 2.30	Lunch break
2.30 - 3.30	Discussion on morning practical session
3.30 - 5.00	Practical work 2 - (continued)

DAY 3 DEVELOPING INFORMATION USE

9.30 - 11.00	Special categories of information and literature - product information - standards information - materials information - statistics information - patents information - report literature - official publications
11.00 - 11.30	Coffee break
11.30 - 1.00	Current awareness and personal files
1.00 - 2.30	Lunch break
2.30 - 3.30	Special case study (e.g. related to particular need of one of the participants)
3.30 - 4.00	Coffee break
4.00 - 5.00	Discussion and course evaluation

APPENDIX 2

Brief Aide-Memoire for Suitability of Library/Information Centre for User Education Workshops

There are certain basic assumptions that must be made.

a. The holding of the workshop is welcomed, in principle, by the Director of the Library/Information Centre.

b. A suitable group of practising scientists/technologists (or students) who are information users can be brought together for the requisite period.

These should not be librarians or information officers, although perhaps a few extra people in this category could sit in the lectures if they wanted to, but not participate in the discussions, practical sessions or evaluation sessions since they are not the target group.

1. Staff .

The lecturers will obviously be involved at all times, but would need help from a professional librarian throughout the whole period, and in particular during the preparation period and the practical sessions of the workshop. Typing assistance will also be required, particularly during the preparation period. Work sheets will need to be prepared from stencils and photocopying facilities (preferably Xerox) will need to be on hand for immediate use.

2. Participants

a. Workshop for Practitioners

The group size should not be in excess of 20-25, and only above 20 if professional help is available for practical sessions. The group should be relatively homogeneous, i.e. if subject interests are too dissimilar then there can be problems. It would be useful to have information as soon as possible about the group including the following:

Firm/employer
Age and qualifications
Subject knowledge/interest
Job description

b. Course for Students

A total of three lectures could be given to any number of participants, but the practical follow-up sessions would need to be limited to a maximum of 30. Information on course/subject knowledge would be necessary as soon as possible as in (a) above.

3. Siting of Workshop

The workshop must be held in an institution which also houses a major collection of abstracting, indexing, bibliographic and reference tools.

The lecture room should be capable of seating the group comfortably but should not be too big. It needs to be capable of 'blacking out' and has to have an adequate projection screen.

a. Stock arrangement

Answers to the following are required:

Is there a centralized collection of finding tools? For example, where are the following located?

i. British Books in Print OR Subject Guide to Books in Print OR Library of Congress, Subject Catalogue OR the National Bibliography of the country concerned.

ii. UN Statistical Yearbook
Handbook of Chemistry and Physics (Chemical Rubber Co.)
Kempe's Engineers' Year-Book

iii. Chemical Abstracts
Science Citation Index
Engineering Index

How does one find a book, for example on:

i. Study techniques

or ii. Management of research organizations?

b. Stock Content

Answers to the following are required:

i. What book lists, national bibliographies and printed catalogues are available?

ii. What is the total number of books in the reference collection in Science and Technology in particular?

iii. How many current abstracting journals are taken?

iv. What is the starting date of the holdings of Chemical Abstracts and Engineering Index?

It would be useful if the instructors could send copies of the following if available (or at least a list of them):

i. Library Guide

ii. Any other publications produced for library users

iii. Any lists of reference books, abstracts, journals, etc., of which copies are freely available in the library.

4. Equipment Requirements

In addition to availability of duplicating and photocopying equipment already indicated, the following will be required:

a. Projector for 35mm slides with multiple slide carrier and remote (pulse) operating facility

b. 16mm projector for sound/cine film

c. Overhead transparency projector

5. General

A detailed programme will need to be produced and circulated as soon as possible.

USER TRAINING AS A COMPONENT OF NATIONAL INFORMATION POLICY

by

J.C. Gray
The British Library

Several papers at the symposium have drawn attention to aspects of national policy for user training; in particular Mr Neelameghan has indicated policy issues at the levels of academic and library/information institutions. This paper is concerned with broad national policy issues, i.e. those that are properly the concern of a UNISIST national focal point for scientific and technical information.

In order to help discussion, this paper takes the form of an outline of possible first steps in the establishment of a policy for user training. It is based on the assumption that the national focal point is already developing policies for supply of, or access to, information services and libraries, and for the education and training of information specialists. It is also presented with much humility since in most, if not all countries, user education appears to be a neglected issue - little studied and little promoted by policy makers.

It is difficult in one short paper to set out an approach which meets the vastly different circumstances of developed and developing countries - or even the very large differences within developing countries themselves. In some developing countries the approach is already sophisticated and on certain aspects, for example the training of users and small industrial firms, there are parallel interests in developed and developing countries. However, a paper such as this should be based on the assumption that in a large number of developing countries an extreme situation exists. There the basic problem of national information policy is how to attack a vicious circle which relates low use of information to poor or non-existing services, which result from insufficient or untrained or badly paid information specialists, who result from low expenditure on information services, which results to a large extent from low interest on the part of the users.

An outline of possible first steps

The following summary of initial steps in policy making is worded so as to apply to as wide a range of situations as possible.

1. Determine, at least in broad terms, the extent of knowledge among future users (students and high-school pupils) and existing users (research workers, practitioners and managers) about how to obtain and use information.

2. Determine, in the light of 1 above and of national economic and social objectives, which levels, types and techniques of training should have priority, given limited resources; in particular whether to concentrate on a "multiplier" approach, i.e. educating those who are in a good position to educate others.

3. At the same time ensure that:

   a) the leading reference works and guides to the literature can be made available for training purposes, with or without the related computer-based services;

   b) access is obtainable to suitable back-up literature from local or remote sources;

   c) the potential teaching resources in the country and neighbouring countries are listed and evaluated.

4. In the light of 2 and 3c above:

   a) determine which institution(s) should be involved in the training programmes at least initially, arrange allocation of responsibilities between them and explore possible sources of finance;

   b) decide what form of technical assistance, if any, should be sought.

5. Provide for evaluation of these initial activities and for their eventual incorporation in a long-term plan.

Assessment of users' knowledge

The purpose of such an assessment is to provide as firm a basis as possible for training policy. It can be done in various ways, notably:

1. A simple assessment of the developing situation; this is probably sufficient in a number of developing countries.

2. Examination of the results of existing studies. This is often of limited value because the results of past studies are not always reliable and because similar studies do not always produce comparable results.

3. Conduct of further studies. Such studies need to be carefully defined, for reasons which are well set out in Mr Wilson's paper.

The papers for the seminar have also brought out the importance of users' motivation to use information, and study of existing motives can be an important part of a preliminary assessment. Three arguments for not using information services fully are commonly encountered in both developed and developing countries:

1. "I know everything of value that is going on in my field". This is probably a true statement for a few scientists working in highly specialized fields at the frontiers of knowledge. But for most scientists it is not true, and some way has to be found, in training, of bringing home the truth.

2. "By the time I have found the information, I may as well have done the work over again." This may be true for a few simple measurements, but in general it shows only how much the user has to learn - through training.

3. "I haven't time to spend getting information". Alas this can be true of many practitioners, though it then often means: 'My boss won't allow me to spend time getting information.' With others it is not true and only means: 'I can't be bothered.' The statement implies that one can get by without information, and therefore forces the training process back to the fundamental issue of the value of information.

Levels, types and techniques of training

The objective of user training is, in effect, to break down these attitudes against a background of developing information services. As stated in Section 5.2 of the UNISIST policy guidelines:[1]

> The general aim of user education should be to reach a situation, at each stage in the progress of science and in the development of information technology, when most if not all scientists recognize their information needs clearly and can assess the strengths and weaknesses of existing and experimental services.

Levels

Since any country, developed or developing, has only limited resources to spend on information, a major policy problem is how much to allot to user training and how to divide the sum between the following levels of training.

1. Future users

- Schoolchildren — This level has been neglected by most developed countries. Developing countries, which often have original and exciting methods of bridging their education gaps, can give a lead here.

- Undergraduates (and postgraduates on courses)	Really two levels: introductory, at the beginning of the academic course, and advanced - before embarking on a course project or leaving to start work.
2. Existing users	
- Postgraduates on research	Training needs to be angled towards research requirements.
- Academic staff	
- Government & Industrial R&D Staff	
- Professional practitioners	Training needs to be angled towards practical, not research requirements.
- Managers	
3. Follow-up training	For example, 'refresher' or 'up-dating' courses or seminars on specific topics.

(Mr Neelameghan has set out the levels of education somewhat differently in his paper, but the differences are not great and can be easily reconciled.)

Types

It is important that those responsible for training policy should consider the various types of user education that can be exploited since the choice between them must depend on local conditions. The UNISIST guidelines distinguish between basic courses of training and involvement of users "in any new experimental service, partly as educational function and partly to secure a 'feed-back' on the value of the service". There is, of course a third and less formal type of training - individual instruction, while on the job, by a fellow scientist or by the institution's library or information staff or by an outside advisor. This type known humorously in British Industry as "sitting by Nellie", is used for many kinds of training, and so far as information training is concerned, can be useful because it enables instruction to be given as and when specific information problems arise.

Policy should also be concerned with a supply of aids for training - films, tape slides, etc - whether generated at home for domestic use or imported from abroad. This need is considered at length in Mr Neelameghan's paper.

Back-up resources

In all types of training it is important to have the leading reference works and guides to the literature available for practical demonstrations, and in some developing countries it may be necessary to give priority to acquiring those works that are not already held in domestic institutions.

The back-up of primary literature is equally important. If user training runs ahead of the provision of literature, frustration can result. For example, a developing country may be able to train users to use 'Current Contents', which is based on core journals, and then meet most resulting demands from literature in national collections. If it wants to do the same for, say, 'Chemical Abstracts', it must first organize the supply of less used literature from remote but comprehensive libraries such as the British Library Lending Division.

Above all it is important to list and evaluate the potential teaching resources in the country and in neighbouring countries, whether they be professional teachers of librarianship or information science, practising librarians or information scientists, or user scientists or technologists who have worked in developed countries and gained a sophisticated knowledge of information services. In this respect it is useful to set out the different kinds of institution that may provide resources for different types of training.

1. National library or information centre. Can devise and run demonstration courses, drawing on its wide range of secondary publications and other information sources, and so give guidelines to institutions wishing to tailor special courses for their own purposes.

2. Academic libraries. Can be largely or wholly responsible, singly or in co-operative groups, for training at undergraduate, postgraduate and academic-staff levels and possibly at other levels too.

3. Library and information science schools. Can co-operate on, or even take over, the functions in 3 above. They may have less contact with users than other organizations; but they can train new information specialists to be user-conscious.

4. Scientific and professional institutions are primarily interested in research and development staff, professional practitioners and professionals who go into management. But they are not usually strong in developing countries and, even in developed countries, most of them have played a subsidiary role.

5. Applied R & D institutes. Can be the main centres of specialized training for R and D workers outside academic organizations and for professionals and technically competent managers.

6. Extension workers. Are the obvious source of training for non-technical managers and can assist with training at other levels.

Evaluation

It is important that the initial training provision should be kept under regular review, not only because it will

inevitably need improvement but because, as information services develop and resources increase the scope and nature of user training must change accordingly. Ultimate responsibility for such reviews should lie with the national focal point, though it may delegate this responsibility to a competent organization.

Action in one Member State

This paper refers at the beginning to the lack of policies and concern about user education in Member States. However, several states have actually taken, or planned to take, individual steps that can be of interest in other states. It may be helpful therefore to set out a brief summary of efforts in my own country - the United Kingdom.

1. Short demonstration courses for university scientists (including social scientists) and librarians, and occasionally for other groups. Organized by the British Library Lending Division (i.e., by the national library).

2. Introductory courses organized by information/liaison officers located in many university libraries.

3. Emphasis on user education in all experiments with computer-based information systems, whether batch-processing or on-line. Here the educational function has been located in scientific departments rather than libraries.

4. A variety of user studies, employing many different techniques, and the recent creation of a user study centre in Sheffield University to develop and promote improved methods of user study and so help to increase the value of the results.

5. Preparation and evaluation of tape-slide guides on a wide range of topics.

6. A weekend seminar on future needs in user education, followed by a select committee which has studied the subject in depth and made recommendations for future action. Resulting activities include.

7. An experiment with three travelling workshops (in biology, mechanical engineering and social welfare) which will demonstrate in various centres how information retrieval may be taught, will stimulate continuing programmes of user education, will provide a basic course for undergraduates relevant to their studies and professional careers, and will produce package courses for use elsewhere; and

8. Several projects concerned with education of school-children, including study of the most effective teaching methods and a 'book flood' experiment on the lines of a project recently completed in New Zealand.

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1 Information policy objectives (UNISIST proposals), SC/74/WS/3, Paris, Unesco, April 1974.